

DECLINING COMPETITIVENESS IN AMERICA'S INDUSTRIAL, TECHNOLOGICAL, AND FINANCIAL BASE

HEARING
BEFORE THE
COMMITTEE ON
BANKING, HOUSING, AND URBAN AFFAIRS
UNITED STATES SENATE
ONE HUNDRED FIRST CONGRESS
SECOND SESSION
ON
THE CHALLENGE TO AMERICA'S ECONOMIC LEADERSHIP, AND HOW
GOVERNMENT AND INDUSTRY SHOULD RESPOND

SEPTEMBER 14, 1990

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DECLINING COMPETITIVENESS IN AMERICA'S INDUSTRIAL, TECHNOLOGICAL, AND FINANCIAL BASE

FRIDAY, SEPTEMBER 14, 1990

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The committee met at 10 a.m., in room SD-538 of the Dirksen Senate Office Building, Senator Donald W. Riegle, Jr. (chairman of the committee) presiding.

Present: Senators Riegle, Shelby, and Dixon.

OPENING STATEMENT OF SENATOR SHELBY

Senator SHELBY. This morning's hearing focuses on U.S. competitiveness. That is, specifically, the ability of American manufacturers to stand up to the competitive challenge that they face from abroad.

The chairman of this committee, Senator Riegle, regrets he's unable to be present at today's hearing. But the schedule of the Senate requires his presence on the floor this morning.

And Mr. Petersen especially understands that issue.

Gentlemen, I would like to thank all of you for agreeing to appear this morning to discuss the crucial challenge to this country's preeminence in the world market.

This is one of a series of hearings that this committee's held on this subject, and we appreciate your taking the time to share your assessment of the problems and your recommendations for improvements.

Each one of you are leaders in your respective fields, and I trust that your testimony will be extremely helpful to the Banking Committee and to the U.S. Senate.

We will start, this morning, by permitting members, as they show up, to make opening statements. Then we will ask each of you to present your remarks. And then we will proceed to the question and answer period.

I mentioned earlier that we're going to have a vote on the floor of the Senate in about 10 or 12 minutes, and we'll have to recess. But that's the order of business up here, as you know, if you've been here before, probably.

This series of hearings that we're starting again, today, and have been into before, has provided a forum for a spectrum of witnesses, including industry leaders, scholars, scientists, and government officials. While their personal bias may have differed, there has been unanimity in their agreement that America is going through a period of economic transition, gradually ceding economic superiority

ty to rival nations better trained and better able to take advantage of the opportunities of the high tech era.

Virtually all of the witnesses before this committee up to now have identified the need for greater cooperation among American companies and industries, and between the public and private sectors. In particular, they have highlighted the comparative advantage of Japan, gained in large part by that nation's willingness to determine and implement an effective national economic strategy.

Conversely, some witnesses have also identified several of the obstacles to American manufacturing superiority, which we've had for a long time. In outlining the problems with America's free market system, it seems that we've forgotten textbook economics. American manufacturers must tolerate inferiorities in the two basic inputs to any product: labor and capital.

America's work force is poorly prepared for the requirements of most of today's high tech manufacturing. A report released earlier this year by the Office of Technology Assessment states that the U.S. educational deficiencies are greatest in science and mathematics.

In the 1960's, American students performed as well as students anywhere in the world. In the mid-1980's, American students rank tenth in arithmetic, twelfth in algebra, and sixteenth in geometry and tests of mathematic competence in 20 countries.

This is hardly surprising when you consider that the American student spends 180 days per year in school, while Japanese students attend class for 240 days and take extensive assignments home for summer vacations.

However, American school children between the ages of 6 and 18 watch 2,000 more hours of TV than they spend in school.

There are very real consequences to our educational shortcomings. American workers arrive on the job unable to perform basic tasks.

Fortune Magazine reports that in 1988, 84 percent of the 23,000 people, who took an exam for entry level jobs at New York Telephone, failed.

The OTA reports that Motorola needs workers with 7th grade math skills, 7th grade math skills. For this, they have spent tens of millions of dollars in training.

Not only do American manufacturers face shortcomings in the quality of American labor, but they must also contend with more expensive, less patient capital. America's anemic personal savings rate, compounded by the enormous Federal budget deficit, has driven up the cost of capital for American companies to an after-tax cost of almost twice that of Japan's.

This translates into less investment in long-term projects as American managers are forced to choose opportunities with shorter term payoffs.

Countries enjoying lower cost of capital, such as Japan and Germany, can invest more in equipment and R&D, as well as operate on lower margins, thus increasing their ability to provide a quality product at a lower price.

I feel strongly that the Federal Government should respond by cutting the capital gains tax in order to stimulate corporate investment, including investment in equipment.

Further, we should balance the scales of debt and equity by permitting corporations to deduct dividends.

The short-term focus of American investors has also forced corporate management to emphasize projects with short-term payoffs.

The adversarial relationship that so often exists between corporate management and corporate owner exacerbates the inability of U.S. manufacturers to compete in a lot of industries.

In contrast, Japanese companies owned by stable webs of investors are less fixated on quarterly reports and daily share prices, and are more concerned with the quality of the product and market share.

Improved shareholder rights, coupled with greater cooperation on the part of institutional investors would, I believe, prove immensely beneficial to American manufacturers.

Yet, even after having identified our weaknesses in the basis production process, we, as a nation, have been hamstrung in our response.

The administration disdains any sort of national strategy, preferring, instead, to rely on the textbook theories of free market economists.

I, too, have supreme respect for the power of free markets and concur in that view that it was these same forces that brought democracy to Eastern Europe.

However, America now competes in a global marketplace.

I fear that market forces are at work, on a global scale, as rival nations usurp our lead and capture our markets, while we continue to politely demand that they play by our rules.

However, while tactics may have changed, I believe that the rules remain the same. The contest to remain a global economic superpower is one in which only the fittest will survive.

While I have confidence that our Nation has the capability to retain its lead, I believe that it will take a comprehensive cooperative effort among our educational system, the private and the public sectors, to make American Government work.

Gentlemen, I have looked over your remarks, and I trust that each of you will be able to provide us with a list of things that the Government must do to initiate this cooperative effort.

And I look forward to your testimony.

Mr. Petersen, do you want to start off?

Mr. PETERSEN. Mr. Shelby, will you have to leave at 10:15, or? Senator SHELBY. What?

Mr. PETERSEN. Are you going to be able to stay through my testimony?

Senator SHELBY. Well, I'm going to try.

Now, your written testimony will be made part of the record in its entirety. And what I would like for each of you to do is briefly summarize with oral.

Mr. PETERSEN. What I might do, then, is read what I would call "the short form" of my comments?

Senator SHELBY. Absolutely. Sure.

**STATEMENT OF DONALD E. PETERSEN, CHAIRMAN EMERITUS,
FORD MOTOR CO., DEARBORN, MI**

Mr. PETERSEN. I'm Donald Petersen, a member of the Council on Competitiveness, and former chairman of the board of the Ford Motor Co.

And I am pleased to have been a part of the team that was responsible for Ford Motor Co.'s competitive turnaround.

There are four fundamentals that I believe were especially critical in guiding Ford during the difficult days of the early 1980's.

Ford's first fundamental commitment was to quality. The second fundamental of Ford's strategy was the commitment to becoming a customer-driven company. Third, we learned to control costs but sensibly. And fourth was management's rediscovery that the critical factor in success is people.

Government policy also played a role in Ford's recovery. We had a few years of stable regulations in the early 1980's. Government also initiated actions that led to the strengthening of the yen.

I've been asked to concentrate today on human resources and quality, as two key areas of international competitiveness.

I don't believe I can overemphasize the importance of human resources as a key to success. A rediscovery of the need to involve all of the Nation's people in the effort toward competitiveness would go a long way toward ensuring America's strength.

For Ford management, this meant recognizing and accepting that the responsibility for a job done well must be shared with employees. It entailed believing that quality, efficiency, and indeed, the success of the company was not the province of management, alone, but of all employees. And it involved changing attitudes, changing methods, and taking the steps necessary to ensure that employees were involved.

The empowerment of people is the wellspring of quality, the other fundamental the committee asked me to focus on today.

At Ford, "Quality is Job One," became our battle cry but, even more so, it became our passion.

In the 3-year period when Ford lost more than \$3 billion, we had to reexamine the basics of the company's operations and make quality improvement the No. 1 priority.

We reasoned, and as it turned out, rightly so, that if quality were the focus of our efforts, then everything else we wanted to achieve would follow: good products, larger market share, higher profits, increased productivity, and reduced cost. We had to convert those who believed, wrongly, that improved quality would increase our costs.

Now, the Ford Motor company is advancing toward what is called "Total Quality Excellence," a system of continuous improvement that challenges the company to be world class in everything it does.

I believe, as a nation, we can be competitive, if we take the view that our work extends far beyond specific industries or products, to our society as a whole.

We have these recommendations for a government policy that would help industry competitiveness, starting first with quality and human resources.

Quality must become intrinsic to our society and part of our national purpose. Quality should be raised to the level and prominence of an American ethic, if we are to remain a world leader, and it must extend to every aspect of our national life.

As for the people side of the equation, the human resources, corporate America is committed to supporting the Nation's educational institutions.

As to the Government role, we recommend that government increase its investment in education. New ideas and leadership are needed in K through 12 education.

Next, we should focus on investments in research equipment and facilities, and fund projects in specific technical disciplines. University research facilities should be modernized, perhaps through a matching grant program for increased Federal and private sector investment.

We also need to encourage more attention toward other policies, making fiscal and monetary policies a top priority.

Getting the Federal budget deficit under control is perhaps the single most effective step in strengthening our Nation's international economic standing.

We should seek regulatory policies that accomplish national goals with the least competitive impact on industry and consumers. For example, as it relates to the automotive industry, we should be very concerned about whether today's clean air and corporate average fuel economy proposals provide sufficient benefits to justify their cost.

Another important area for attention is our research and development, our R&D policy. We need coordinated trade policies that are aimed at eliminating U.S. merchandise trade deficits, including policies aimed at slowing foreign imports into the United States.

Finally, our Government must work in concert with major trading partners to establish practices that will result in foreign market access for U.S. goods.

These are some of my thoughts on how we can begin to respond to the competitive challenge. I have a more expanded version of these thoughts.

I certainly don't pretend to have all the answers to such a complicated issue, and I know that meeting the challenge won't be easy. But I also believe we all agree that it's essential.

Thank you.

[The complete prepared statement of Donald E. Petersen follows:]

Council on Competitiveness

TESTIMONY OF DONALD E. PETERSEN

BEFORE THE U.S. SENATE

COMMITTEE ON BANKING, HOUSING AND URBAN AFFAIRS

SEPTEMBER 14, 1990

Summary of
Testimony of Donald E. Petersen
Before the U.S. Senate
Committee On Banking, Housing And Urban Affairs
September 14, 1990

Mr. Chairman and members of the committee, I am Donald Petersen, a member of the Council on Competitiveness and former chairman of the board of the Ford Motor Company.

I am pleased to have been a part of the team that was responsible for Ford Motor Company's competitive turnaround.

There are four fundamentals that I believe were especially critical in guiding Ford during the difficult days of the early 1980s.

Ford's first fundamental commitment was to quality.

The second fundamental of Ford's strategy was the commitment to become a customer-driven company.

Third, we learned to control costs -- sensibly.

Fourth was management's rediscovery that the critical factor in success is people.

Government policy also played a role in Ford's recovery. We had a few years of stable regulations. Government also initiated actions that led to the strengthening of the yen.

I have been asked to concentrate today on human resources and quality as two key areas of international competitiveness.

I don't believe I can overemphasize the importance of human resources as a key to success. A rediscovery of the need to involve all of the nation's people in the effort toward competitiveness would go a long way toward ensuring America's strength.

For Ford management, this meant recognizing and accepting that the responsibility for a job done well must be shared with employees. It entailed believing that quality, efficiency -- and, indeed, the success of the company -- was not the province of management alone but of all employees. And it

involved changing attitudes, changing methods and taking the steps necessary to ensure that employees were involved.

The empowerment of people is the wellspring of quality, the other fundamental the Council asked me to focus on today.

At Ford, "Quality is Job One" became our battle cry but even more so, it became our passion.

In the three-year period when Ford lost more than \$3 billion, we had to re-examine the basics of the company's operations and make quality improvement the number one priority.

We reasoned -- and, as it turned out, rightly so -- that if quality were the focus of our efforts then everything else we wanted to achieve would follow -- good products, larger market share, higher profits, increased productivity and reduced costs. We had to convert those who believed, wrongly, that improved quality would increase our costs.

Now the Ford Motor Company is advancing toward what is called "Total Quality Excellence," a system of continuous improvement that challenges the company to be world-class in everything it does.

I believe, as a nation, we can be competitive -- if we take the view that our work extends far beyond specific industries or products to our society as a whole.

We have these recommendations for a government policy that would help industry competitiveness -- starting first with quality and human resources.

Quality must become intrinsic to our society and part of our national purpose. Quality should be raised to the level and prominence of an American ethic if we are to remain a world leader and it must extend to every aspect of our national life.

As for the people side of the equation -- human resources -- corporate America is committed to supporting the nation's educational institutions. As to the government role, we recommend that government

increase its investment in education. New ideas and leadership are needed in K-12 education.

Next we should focus on investments in research equipment and facilities and fund projects in specific technical disciplines. University research facilities should be modernized -- perhaps through a matching grant program for increased federal and private sector investment.

We also need to encourage more attention toward other policies: Making fiscal and monetary policies a top priority. Getting the federal budget deficit under control is, perhaps, the single most effective step in strengthening our nation's international economic standing.

We should seek regulatory policies that accomplish national goals with the least competitive impact on industry and consumers. For example, as it relates to the automotive industry, we should be very concerned about whether today's clean air and corporate average fuel economy proposals provide sufficient benefits to justify their cost. Another important area for attention is our research and development (R&D) policy.

We need coordinated trade policies that are aimed at eliminating U. S. merchandise trade deficits -- including policies aimed at slowing foreign imports into the United States. Finally, our government must work in concert with major trading partners to establish practices that will result in foreign market access for U. S. goods.

Those are some of my thoughts on how we can begin to respond to the competitive challenge. I certainly don't pretend to have all the answers to such a complicated issue and I know that meeting the challenge won't be easy. But I also believe we all agree that it's essential.

Testimony of Donald E. Petersen
Before the U.S. Senate
Committee On Banking, Housing And Urban Affairs
September 14, 1990

Mr. Chairman and members of the committee, I am Donald Petersen, a member of the Council on Competitiveness and former chairman of the board of the Ford Motor Company. I appreciate this opportunity to share my views with you on how our government and private sector should respond to the long-term competitive challenge facing our nation. I'd like to draw from personal experiences in the automotive industry because that is the business I know best.

I am pleased to have been a part of the team that was responsible for Ford Motor Company's competitive turnaround. In the late 1970s and the early part of the 1980s, Ford faced some tough times. In the three-year period between 1980 and 1982, the company lost more than \$3 billion. But, as a result of its competitive strategy, Ford was able to turn its profit/loss picture around -- from \$3 billion in losses to record after-tax profits of \$2.9 billion in 1984.

There are four fundamentals that I believe were especially critical in guiding Ford during the difficult days of the early 1980s. We called it the "back to the basics" approach to becoming and remaining a strong player in a competitive global environment.

Ford's first fundamental commitment was to quality. We made quality our number one objective. And, as you can surmise from the company's advertising, it still is. Ford's goal is to improve continuously, throughout its business, until its quality is the best in the world -- then to keep on improving. In a few minutes I'll elaborate more on the quality aspect of Ford's strategy.

The second fundamental of Ford's strategy was the commitment to become a customer-driven company. In other words, customers are the focus of

everything it does. Ford recognized that, in the end, choice belongs to the customer and in order for customers to choose Ford, its products and services must meet customers' needs.

Third, we learned to control costs -- sensibly. This is a difficult exercise. From 1980 to 1985, Ford pared about \$5 billion from annual operating costs, while at the same time investing some \$21.5 billion in facilities and tooling for new products.

The fourth and most important fundamental aspect of Ford's competitive strategy was management's rediscovery that the critical factor in success is people.

Those fundamentals -- commitments to quality, customers, cost controls, and to our people -- were lessons Ford management learned during the climb back to profitability.

We believe we did our part in the private sector but government policy also played a role in Ford's recovery. We had a few years of stable regulations at a time when we needed to spend every dollar on getting competitive. Government also initiated actions that led to the strengthening of the yen. When the yen -- which had been under-valued for a decade -- finally strengthened in 1985, we were able to pull within hundreds of dollars of the Japanese in costs. Unfortunately, the yen/dollar relationship has gone the other way in the last few years.

I have been asked to concentrate today on human resources and quality as two key areas of international competitiveness.

I don't believe I can overemphasize the importance of human resources... people... as a key to success. A rediscovery of the need to involve all of the nation's people in the effort toward competitiveness would go a long way toward ensuring America's strength.

Again, I'd like to refer back to my experiences at Ford. The basis of our people strategy was quite simple. It can be summed up like this:

People gain an intrinsic satisfaction from doing a job well. People want to do well in their jobs and they will strive for excellence if they feel they are given the opportunity.

For Ford management, this meant recognizing and accepting that the responsibility for a job done well must be shared with employees. It entailed believing that quality, efficiency -- and, indeed, the success of the company -- was not the province of management alone but of all employees. And it involved changing attitudes, changing methods and taking the steps necessary to ensure that employees were involved. I call it "empowering employees in the business of the company."

A variety of programs were put in place that promoted employee involvement, participatory management and lifelong education and professional development. These programs range from the very formalized to the ad hoc. We haven't time to list them all here today, but suffice it to say that they were aimed at providing employees with the chance to contribute their minds and hopefully their hearts -- as well as their muscles. We sought to engender and support team spirit in every function throughout the organization.

However organizations can't obtain team spirit by simply decreeing "it shall be so." That would be like the story I once heard about the CEO who told his vice president for personnel, "We need a new culture around here. Get me one by Monday."

The reason teamwork is so important is because it inspires a "culture of responsibility." It fosters commitment to a mutual goal. People are the critical factor for success because people do the work and generate the ideas -- and ideas lead to progress.

There are any number of Ford experiences I could cite that demonstrate the power of this fundamental of people empowerment. But I'd like to use one about Ford's Sharonville, Ohio transmission plant as an example. As late as 1986, the plant faced an uncertain future. The transmissions they

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produced were technologically obsolete and were made for vehicles that were being phased out.

However, management and the UAW took a totally fresh approach, directly involving the workers in such critical areas as quality, cost and production: "Business Teams" were formed, each with 12 to 13 members. The teams were given specific objectives to meet, but they had complete freedom in deciding how to meet them.

The projected improvements in cost and quality led the Sharonville Plant to be awarded the production of Ford's electronic four-speed overdrive automatic transmission. It turned out to be one of the smoothest introductions of a new product that we have ever accomplished and our Sharonville people were able to do it while still building existing transmissions. They also went on to win Ford's Q-1 Award -- which recognizes the achievement of superior quality in a product.

People. We must believe in their abilities, trust their judgement, involve them -- individually and through teamwork -- in the organization's goals. I don't know how many college textbooks would offer this as a competitive strategy. But I, and thousands of people at Ford Motor Company, know its real value.

By this example, I hope you can see that the empowerment of people is the wellspring of quality, the other fundamental the Council asked me to focus on today.

At Ford, "Quality is Job One" became our battle cry but even more so, it became our passion. No manager, no leader can make a quality organization all by himself or herself. You can't direct people to generate quality in isolation and expect that, by magic, those individual efforts will merge effectively. It gets back to the idea of teamwork and the "culture of responsibility."

In that three-year period when Ford lost more than \$3 billion, the

company was pitched in a battle against an oil crisis, increasing foreign competition, high interest rates, high inflation, spiraling costs and unfavorable currency imbalances. While we, in management, wrestled with the issues we realized that for our company to succeed -- even survive -- it would have to make some dramatic changes. We had to re-examine the basics of the company's operations and make quality improvement the number one priority.

We reasoned -- and, as it turned out, rightly so -- that if quality were the focus of our efforts then everything else we wanted to achieve would follow -- good products, larger market share, higher profits, increased productivity and reduced costs. We had to convert those who believed, wrongly, that improved quality would increase our costs.

Management also had to redirect its thinking about the definition of quality. For years our concept of quality meant setting standards and tolerances, monitoring values we could measure conveniently and repairing or discarding the pieces that failed to "measure up." The process was what we called "defect detection."

Early in the 1980s we began to extensively apply the theories of statistical process control -- a disciplined charting procedure that tracks the performance of, for example, a process or a machine and makes it possible to pinpoint and correct deviations from prescribed behavior. With this change, we moved toward a higher plane called "defect prevention."

Now the Ford Motor Company is advancing toward what is called "Total Quality Excellence," a system of continuous improvement that challenges the company to be world-class in everything it does. Total Quality Excellence incorporates a focus on customers' wants and needs and recognizes that for every single task within the business, there is a customer to satisfy.

The strategy is to continually improve every transaction -- every process within the company, the dealer organization and the supply base. The company's "end customers" can recognize the effort in the excellence of Ford's

products and services.

I'm pleased to see that on a national basis there are positive moves toward recognizing the importance of total quality. The Malcolm Baldrige National Quality Awards -- given by the President to businesses for excellence in quality management -- is one example. And on the education side, the Business-Higher Education Forum's initiative -- aimed at the pursuit of quality in the development of America's human potential -- is another.

I believe, as a nation, we can be competitive -- if we take the view that our work extends far beyond specific industries or products to our society as a whole. We have many world-class American industries today. The business basics I've described today -- a commitment to quality and the empowerment and involvement of people -- mirror the fundamentals of our nation's competitive challenge.

We have these recommendations for a government policy that would help industry competitiveness -- starting first with quality and human resources.

What I've been describing as a heightened sense of quality at Ford Motor Company applies universally -- not just to automobile manufacturers, but to everyone in every walk of life and at every level of capacity. Those who understand this will succeed in business -- any business. In fact, quality today is more than just an obligation of the business sector to its customers. It's everyone's obligation. Quality gets people's attention and it must become intrinsic to our society and part of our national purpose. I believe that quality should be raised to the level and prominence of an American ethic if we are to remain a world leader and it must extend to every aspect of our national life.

As for the people side of the equation -- human resources -- corporate America is committed to supporting the nation's educational institutions. As confirmed by a recent research report by the Council For Aid To Education, corporations donated more than \$1.9 billion directly to colleges

and universities last year, despite a continued poor profit picture. That figure does not include contributions such as support of pre-college education for public schools, support of education-related organizations or scholarships awarded directly to individuals. Education and training are the primary systems by which the human capital of our nation can be preserved and increased.

I can tell you that corporate America sees education and training as an investment in competitiveness. U.S. employers are spending billions of dollars annually on remedial training for new employees who are poorly educated and they also are investing heavily in updating employee skills to keep pace with technological change. Within Ford, for example, education and training programs have been established and are available for every employee -- from hourly to salaried to senior executive.

As to the government role, we recommend that government increase its investment in education. New ideas and leadership are needed in K-12 education if we are going to have the skills we need to compete in tomorrow's world. Also, we would make science and engineering education a priority for investment to ensure that there is adequate funding as technological leadership becomes increasingly important.

Next we should focus on investments in research equipment and facilities and fund projects in specific technical disciplines. University research facilities should be modernized -- perhaps through a matching grant program for increased federal and private sector investment. Many foreign competitors have been aggressively building up their research and development infrastructures over the past two decades while U.S. federal funding for university research plants and facilities has declined by 95 percent in real terms.

We also need to encourage more attention toward other policies, including:

Making fiscal and monetary policies a top priority. Getting the

federal budget deficit under control is, perhaps, the single most effective step in strengthening our nation's international economic standing. Deficit reduction will help slow the growth in imports, contribute to the emergence of a more stable and competitively priced currency and, by easing pressure on financial markets, contribute to lower interest rates and spur domestic investment. While it is important to continue to work on controlling inflation, we also need policies that ensure that capital is available at reasonable prices to spur investment.

We should seek regulatory policies that accomplish national goals with the least competitive impact on industry and consumers. For example, as it relates to the automotive industry, we should be very concerned about whether today's clean air and corporate average fuel economy proposals provide sufficient benefits to justify their cost. Another important area for attention is our research and development (R&D) policy. Because R&D is a long-term proposition for industry, stability is needed in both government funding of private research and in tax policies affecting R&D investment. Specifically, permanent R&D tax credits should be adopted.

We need coordinated trade policies that are aimed at eliminating U. S. merchandise trade deficits -- including policies aimed at slowing foreign imports into the United States. Without a decline in imports, major reductions in the trade deficit are impossible. We also need policies which assure a more competitively-priced and stable dollar. Efforts to reduce imports are being compromised by efforts to prop up the dollar's value at artificially high levels. Finally, our government must work in concert with our major trading partners to establish practices that will result in foreign market access for U. S. goods.

Those are some of my thoughts on how we can begin to respond to the competitive challenge. I certainly don't pretend to have all the answers to such a complicated issue and I know that meeting the challenge won't be easy. But I also believe we all agree that it's essential. Again, I appreciate your invitation to speak today. Thank you.

Senator SHELBY. Thank you, Mr. Petersen.

We have that vote that we all dread and delay on the floor. It's a cloture vote. And I want to recess the hearings just for a few minutes, and then I'll come straight back.

[Recess.]

Senator DIXON. Ladies and gentlemen, we'll bring this hearing back to order. When I left, the roll call was about half completed, so I expect you'll see people drifting back in in the next 5 minutes or so.

And I think, Mr. Schacht, had you begun your testimony?

Mr. SCHACHT. No, sir, I had not.

Senator DIXON. Then we're pleased to have here this morning, Mr. Henry B. Schacht, chairman and CEO of Cummins Engine Co. in Columbus, IN.

Thank you, Mr. Schacht, for being here.

**STATEMENT OF HENRY B. SCHACHT, CHAIRMAN AND CEO,
CUMMINS ENGINE CO., COLUMBUS, IN**

Mr. SCHACHT. Thank you, Mr. Senator.

We've been asked to summarize our testimony, so I'll read the brief summary that accompanied my formal remarks. And I think, unsurprisingly, you will find them very similar to those of the other two panel members.

I just say that competitiveness of U.S. industry has been discussed at length over the course of the past few years. In my testimony today, I would like to focus on three topics which have been critical to Cummins' quest for competitiveness: long-term patient capital; strategic alliances; and consistent, stable Federal Government regulations.

The highly cyclical diesel engine industry is likely to feel the effects of a wavering economy earlier than other industries. In fact, our major market, heavy duty trucks, has been in a recession since July of last year. This downturn has deepened significantly in the last 6 weeks. The downturns and the inevitable upturns in our industry require careful investment and planning by investors and managers.

Patient capital, or investments made for the long term, are critical for capital goods industries. The returns on investment will vary according to the stage of the cycle described above. A quarterly focus on the part of investors encourages managers to delay investment and mortgage the future for today's profits. This behavior detracts from the long term competitiveness of companies and industries and, therefore, the United States.

Strategic alliances provide the opportunity to share investment across higher volumes. It is becoming increasingly difficult for individual companies, irrespective of their size, to make the necessary research and development investments for all the necessary technology on their own.

On July 16, Cummins announced a series of agreements with Ford, Tenneco, and Kubota, forming strategic alliances which we believe will enable all four companies to develop state-of-the-art technology and world class manufacturing, marketing, and service.

Cummins has tried to do its part to maintain its competitiveness. In the early 1980's, we made the decision to invest \$1.3 billion in new products, begin a restructuring program to reduce costs by 30 percent, and preemptively reduce prices by 30 percent. These programs left Cummins in a strong position as a worldwide technical leader. The Japanese competition did not gain a foothold in our main U.S. markets. This year, we announced our new strategic alliances. However, we cannot do it alone. We need rational long term vision from the investment community and the Government.

Consistent and stable Federal regulations allow industry an opportunity to meet new standards. An example of this type of regulation critical to Cummins and the entire industry is the Clean Air Act.

As a leader in research and development, and application of advanced diesel emission control technology, Cummins and the diesel engine industry support the adoption of technology, forcing clean air standards for heavy duty diesel engines. The new standards must, however, provide Cummins and other manufacturers with adequate lead time—notice of regulated changes to emissions standards—and stability—the period of time between required emission changes—to allow an efficient technology development effort and maintenance of a world competitive cost structure to support continued investment in new technology.

Because of tough U.S. emissions regulations of the past decade, our industry is poised to move forcefully into global leadership now. Unfortunately, legislative proposals mandating alternative fuels, which are now in the Clean Air Act conference committee, threaten 35 to 50 percent of the U.S. heavy duty diesel market. The unintended consequence of forcing alternative fuels too fast too soon will be that older engines will run longer, rather than be replaced by cleaner diesels of the 1990's. Alternative fuels must be introduced in a manner which balances inevitable competing considerations in energy, economic, and environmental policy.

This example demonstrates the need for coherent, consistent, and stable legislative policy, which stimulates global competitiveness by allowing industry to plan for the long term, and encouraging the capital markets to do the same.

Thank you.

[The complete prepared statement of Henry B. Schacht follows:]

Council on Competitiveness

**Testimony of
Mr. Henry B. Schacht
Chairman and CEO
Cummins Engine Company
Columbus, Indiana**

**Presented To
The U.S. Senate Committee On Banking,
Housing and Urban Affairs**

September 14, 1990

Testimony of Mr. Henry B. Schacht, Chairman and CEO
Cummins Engine Company
Columbus, Indiana

To the Senate Banking Committee

Hearing on Competitiveness

September 14, 1990

Summary of Testimony

Competitiveness of U.S. industry has been discussed at length over the course of the past few years. In my testimony today, I would like to focus on three topics which have been critical to Cummins' quest for competitiveness: long-term patient capital, strategic alliances, and consistent, stable federal government regulations.

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Committee, would eliminate 35-50% of the U.S. heavy duty diesel market. The unintended consequence of forcing alternative fuels too fast and too soon will be that older engines will run longer, rather than be replaced by cleaner diesels of the 1990s. Alternative fuels must be introduced in a manner which balances inevitable competing considerations in energy, economic and environmental policy.

This example demonstrates the need for coherent, consistent, and stable legislative policy which, stimulates global competitiveness by allowing industry to plan for the long-term and encouraging the capital markets to focus on long-term growth.

Testimony of Mr. Henry B. Schacht, Chairman and CEO
Cummins Engine Company
Columbus, Indiana

To the Senate Banking Committee

Hearing on Competitiveness

September 14, 1990

Good morning Mr. Chairman and members of the committee.

I would like to begin by briefly reviewing the dynamics of the diesel engine industry. Then I will discuss Cummins' approach to becoming a world class manufacturer. Finally, I will address what I consider to be three issues critical to U.S. competitiveness.

The diesel engine industry

Today, the climate in the diesel engine industry is marked by uncertainty. The current economic situation in the U.S. has stalled growth and reduced capital investment industry-wide. Sales of diesel engines, used to power trucks, construction and industrial equipment, generator sets, work and pleasure boats, have been depressed since July of last year. Truck production, a major indicator in our industry, is forecast at 120,000 units for 1990, down 24% from 1989. (Please see chart.) The outlook for 1991 is even more bleak.

The potential impact of these swings is widespread. Currently, the diesel engine industry employs over 400,000 people worldwide and last year had gross sales of approximately \$60B. Migration toward smaller, more efficient engines has changed the dynamics of the market somewhat, broadening the field of competitors and shifting development toward smaller engines. Diesel engines continue to provide power with unsurpassed fuel efficiency and durability, low maintenance and high reliability. The industry's work on diesel emissions is yielding cleaner burning and smoke free engines as well. Companies in the heavy-duty diesel industry constitute a unique, capital goods niche market.

For the past 15 years industry participants have been hard at work to become competitive worldwide and to meet low emission standards cost-effectively. Today, the U.S. industry is the worldwide technical leader and competitive worldwide in product quality and manufacturing efficiency. This has been achieved through major and continuing investments in technology, products, and plant equipment while holding prices down. At the same time, industry has met increasingly stringent federal emission standards. Between 1975 and 1994, the industry will have achieved total reductions of 69% in emissions of oxides of nitrogen (NOx) and 90% in particulate matter emissions.

The cost of these emissions reductions (an estimated \$1.5B since 1975) can not be fully passed along to consumers because of intense global competition in the heavy duty diesel engine industry. By adapting a very aggressive technical and commercial attitude, U.S. producers have lost very little market share to foreign competition in the past decade. However, the heavy investment required to achieve emissions standards and the actions by U.S. producers to meet foreign price competition have hurt severely their financial performance during this period. For example, from 1985-88, return on equity in the U.S. heavy duty engine, equipment, and components sector averaged 1.2% per year, compared with 13% for the Fortune 500 industrial sector.

Despite some of the grim sounding history and projections, the U.S. diesel engine industry is making the requisite sacrifices and pushing forward. Because of strict emissions standards, U.S. industry is uniquely poised to take advantage of European and Japanese markets as stricter emissions standards are introduced there. What this industry needs most from the federal government are consistent, long-term policy decisions which balance the inevitable trade-offs in energy, environmental and economic impact. Such coherent policies will allow us to deploy the limited financial, human and technical resources of our

industry in the most cost-beneficial manner to compete in domestic and global markets.

Cummins' strategies to succeed in world markets

In the late 1970's at Cummins Engine Company, we recognized that significant changes were taking place in the marketplace: emerging competitors from Japan, more demanding customers, and the introduction of emission standards. In order to maintain our leadership position in the industry, in 1979 we embarked on a six year, \$1.3B investment strategy which included the development of smaller, cleaner, more efficient engines.

In addition to the investment strategy, Cummins undertook a major cost reduction program. We recognized that the Japanese had a 30% cost advantage and we realized we had to achieve world class costs. We began a program to reduce costs by 30%, which meant workforce and workspace reductions, improvements in productivity, and improvement in quality. Because we were unable to cut our costs immediately, we took the preemptive measure of unilaterally reducing prices by 30% in an effort to maintain our strong market share against Japanese competition.

By 1985, on all of our new engines, Cummins had succeeded in reducing overall costs by 22%, the workforce had been cut by 22%, and we were working with 30% less floor space. In addition we had reduced our number of suppliers by 50% and achieved a 50% reduction in the number of engine parts. As a result of these efficiency-conscious measures our labor productivity is up 45%, our inventories have been reduced by 40%, and our breakeven point is now 31% lower. Although the measures we forced upon ourselves were severe, they were necessary to remain competitive. As a result of these actions, no Japanese engines are sold in our main U.S. market today.

Our concentration on fuel efficiency, improved performance, reliability and durability, cost, quality, and delivery have allowed us to efficiently keep foreign competition in check. Our current objectives, which we think are imperative to maintain our position as a world class manufacturer of engines, include a commitment to continuous improvements at every level and in every business area, being customer led in every facet of the business, and achieving the highest quality product at the lowest cost with on time delivery.

Three keys to U.S. competitivenessLong-term view

At the commencement of our investment strategy in the late 1970's, Cummins' management realized that our efforts would be viewed tentatively by Wall Street. At that time fuel prices were rising, so we were lauded for our efforts. When fuel prices stabilized in 1979, analysts suggested that we had been too hasty in our capital investment decisions. This typifies the way in which many investment analysts, money managers, and investors approach their investments and recommendations - immediate definitive conclusions based on snap shots in time. I have been concerned for many years, along with others, that a short-term perspective by our investment community is afflicting American industry.

I realize that we all tire of comparisons to the Japanese, but in this area especially, I would be remiss in not mentioning their example. The Japanese have given new definition to the term, patient capital. Some Japanese managers are basing their strategies on time horizons that stretch out over many decades. I am not suggesting that Wall Street or Corporate America adopt

this extreme in their investment decisions, but that we need to move beyond the quarterly standards that force management to make decisions based solely on the short term. This is especially critical in highly cyclical industries. Capital must be at least as patient as the industrial cycle in order to realize a return on investment. It is disruptive to hold these industries to short-term standards, given their economic sensitivities and the need to invest continuously in technology improvement.

The short-term focus of the investment community is only one of the problems. A wide range of possible causes of short-term bias have been identified. High interest rates and capital costs, compensation practices, as well as Wall Street pressure have also contributed. Consequently, the resolution of these problems will require the concerted efforts of all parties involved. This includes management, labor, the investment community, and government.

Fortunately, American management and others are beginning to recognize the critical nature of this problem. The Harvard Business School and the Council of Competitiveness have begun a joint project to conduct original and broadly based research on the existence, causes, and consequences of a short time horizon and the resulting underinvestment in American industry. The

project entitled "Time Horizons of American Management" is ongoing and will begin to yield results in the first quarter of 1991. I have attached a more complete description of the project for your perusal. We must be careful not only to study this problem, but we need actively to do our part to reverse the counterproductive tendencies.

Government actions to encourage investment at the expense of consumption are needed urgently. Tax incentives and penalties are powerful motivators and need to be utilized fully. Particular attention to technology support is required.

Strategic alliances

Patient capital and long-term time horizons support the concept of strategic alliances. Joint ventures have been used by business for many years for many reasons. Their advantages include sharing capital and development investment, gaining economies of scale, and learning from the partnership. Strategic alliances go beyond the scope of joint ventures and are occurring with increasing frequency within the engine and component industry and other capital goods industries out of necessity. It is becoming increasingly difficult for individual companies, irrespective of their size, to make the necessary research and

development investments for all the necessary technology on their own. In addition, it is difficult for these companies to maintain a worldwide presence and effectiveness in all the systems and components necessary to meet the customers' demands.

On July 16, we announced a series of agreements with Ford Motor Company, Tenneco, Inc., and Kubota Corp. that will complement our existing automotive and industrial engine business. As part of these understandings, each of the three have made an equity investment in Cummins.

These actions, which accomplish our previously announced goal of obtaining additional equity capital, will result in:

- . A long term supply agreement with Ford to assure future availability of Cummins B and C Series diesel engines in Ford medium trucks and partnership in long-term product-planning for midrange diesels in medium trucks.
- . Expansion and strengthening of Cummins' and Kubota's complementary diesel engine product offerings and a potential joint venture by the two companies for small diesel engine manufacturing in the European Community (Kubota, a \$5.4 billion diversified industrial company, is a

leading small diesel manufacturer which licenses Onan Corp., a Cummins subsidiary, to produce its gasoline engines and supplies to Onan small gasoline and diesel engines.)

- . Further opportunities to build on our successful 50/50 joint venture with Tenneco established in 1980 to manufacture B and C Series engines at Consolidated Diesel Company in Rocky Mount, North Carolina, and
- . Acquisition by Ford and Tenneco of 1.6 million shares (each) of Cummins common stock and by Kubota of 799,760 shares, all at a price of \$62.50 per share.

Each company has its own agenda and expectations, but the common denominator is a commitment to long-term manufacturing excellence and growth, each focusing on its particular strengths to make the alliances work. Cross-border and in-country alliances need to be encouraged; anti-trust concerns need to be addressed.

Environmental awareness/leadership

An area that may not often be associated with competitiveness, but is nonetheless a significant factor to

American industry, is environmental legislation -- specifically, the Clean Air Act. Although I am aware of the potential effects of this act on other industries, I am obviously most closely associated with its impact on Cummins.

First, as an industry leader in research, development, and application of advanced diesel emission control technology, Cummins and the diesel engine industry support the adoption of technology-forcing clean air standards for heavy-duty diesel engines. The new standards must, however, provide Cummins and other manufacturers with adequate leadtime (notice of regulated changes to emissions standards) and stability (the period of time between required emission changes) to allow an efficient technology development effort and maintenance of a world competitive cost structure to support continued investment in new technology.

Second, because the U.S. has taken the lead in environmental policy, the U.S. diesel industry is poised to make the cleanest, most cost-effective engines in the world in the 1990's. European and Japanese manufacturers of engines and equipment are flocking to U.S. producers, asking us to provide the engines they need for emerging lower standards in Asia and Europe.

Ironically, at the very moment this industry is poised to move forcefully into global leadership, mandatory alternative fuels legislative proposals which are now in the Clean Air Act Conference Committee would eliminate 35-50% of the U.S. heavy duty diesel market, while encouraging increased use of gasoline and increased emissions of carbon monoxide, carbon dioxide (greenhouse gas) and non-methane hydrocarbons (ozone pre-cursors).

More importantly, because diesels run hundreds of thousands of miles--and then can be rebuilt several times--we fully expect our customers simply will run their existing engines as long as possible and refuse to buy alternative fueled engines. The unintended consequence of forcing alternative fuels too fast and too soon will be that older engines will run longer, rather than be replaced by the smokeless, clean diesel engines of the 1990's.

Cummins is not a company which cries, like Chicken Little, "The sky is falling!", but based on our experience over the past ten years, I can assure you that the remaining U.S. heavy duty engine companies can not survive, much less fund research into multiple alternative fuels and warrant heavy duty engine emissions on each engine up to 290,000 miles with the elimination of 35-50% of the market's contribution to their overhead costs.

What we can do is to produce, over time, the cleanest, smokeless, most fuel-efficient engines in the world which will contribute positively to a cleaner environment. We are convinced that the future of a healthy U.S. environment, economy, and energy policy will include diesels - as well as carefully positioned alternative fueled engines.

Recommendations

Congress must be aware of the widespread impact to the economy, the environment and U.S. energy policy caused by the Clean Air Act.

If Congress is committed to enhancing the competitiveness of U.S. manufacturers, it must start by enacting legislation that:

1. Balances energy, economic and environmental concerns;
2. Enables industry to plan with reasonable certainty and stability to meet technology - forcing standards; and
3. Motivates the market place to purchase newer technology instead of keeping the old.

Congress should enact policies which encourage patient capital and reward the innovation of research and development.

Congress should not discourage strategic alliances.

I have been convinced for several years that we must reduce the federal deficit. Every interest group and every program must participate in this difficult task of self-discipline. After careful analysis and painful sacrifice, if additional revenue is needed, it should be raised.

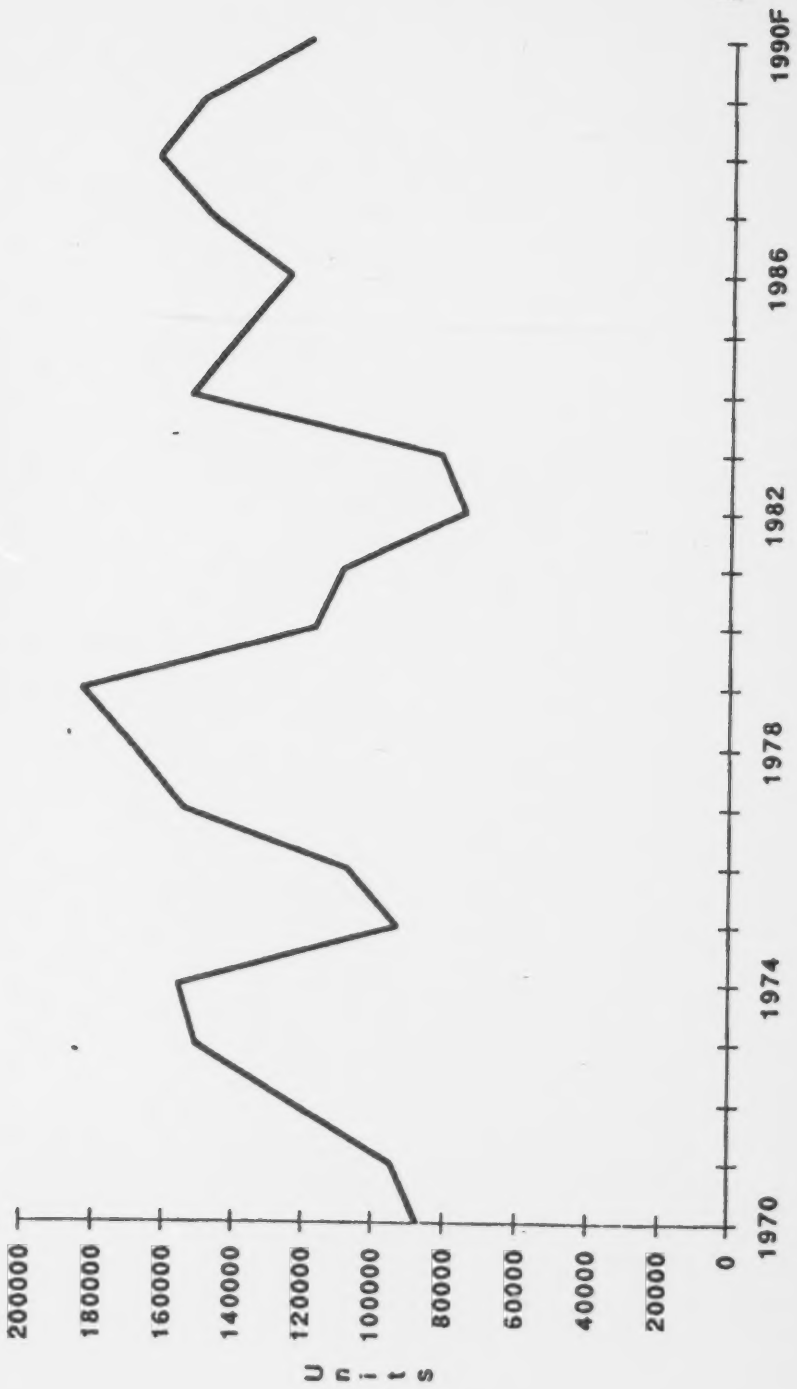
Congress and the Administration should focus attention on the importance of a challenging, world-class education for America's youth, especially the underserved and the very young, where our losses of human development are the greatest. A revolution must take place in our education system now or we will face incalculable economic and social costs for generations to come.

Above all, we need legislation that is consistent and stable, allowing industry to plan for the long-term and encouraging the capital markets to focus on long-term growth.

Conclusions

Hearings like this are an important forum to raise awareness, but we must not forget our responsibility to act on these matters in a carefully structured manner. As managers, we need to continue to take the hard medicine and adapt to the changing world environment and the changing needs of the customer. If we are to continue to succeed as a country, we must all change our perspectives and focus on long-term horizons. Temporary relief measures are easily conceived and implemented and seldom are effective for any significant period of time. Long-term, permanent solutions take vision and sacrifice, but are well worth the patience and price.

NA Heavy Duty Truck Production 1970-90



TIME HORIZONS OF AMERICAN MANAGEMENT

A Joint Project

HARVARD UNIVERSITY

COUNCIL ON COMPETITIVENESS

There has been persistent and growing concern that a short-term perspective is afflicting American industry. Short time horizons could lead to underinvestment by American companies in technology development, human resources, product quality, and capital assets

The Harvard Business School and the Council on Competitiveness have begun a joint project to conduct original and broadly based research on the existence, causes, and consequences of a short time horizon and resulting underinvestment in American industry.

A wide range of possible causes of short-term bias have been identified, ranging from high capital costs to Wall Street pressure and compensation practices. The work will involve scholars from leading American universities chosen for their expertise in the array of subjects that bear on the question. The project is based on the premise that underinvestment is the result of a series of interrelated influences.

- The heart of the project will involve a series of papers, grouped under the categories of capital providers, management structures, governance structures, and employee structures.
- One paper aims to document the existence of the problem in terms of comparative rates of investment among nations, cutting through the debate over which statistical measures are best.
- A historical paper analyzes how the institutions and practices bearing on investment behavior evolved over time, especially in the postwar period. A large-scale survey of managers in America, Germany, and Japan will provide an unprecedented body of evidence about investment and time horizons, and their influences.
- Finally a synthesis paper will integrate the pieces into a coherent whole recognizing the interrelations among the causes and effects.

Beginning in the fall of 1990, the Council staff will work to involve leaders within the Executive and Legislative branch in the project through a series of meetings and seminars to discuss the preliminary results and develop potential policy actions. First drafts of the research papers will be discussed at a seminar of the authors and invited experts in the relevant fields in mid-December 1990. The final papers are to be submitted during the first quarter of 1991.

The results of the project will serve as input to Council deliberations and a Council report. The report will present an overview of the research findings and their impact on corporate investments in plant and equipment, human resources, and research and development, and contain specific suggestions and recommendations for the public and private sectors. The final report is scheduled for approval at the summer 1991 meeting of the Council's Executive Committee. The Council membership and staff will work to bring the content of the report and its recommendations to the attention of the general public, key government officials, corporate executives, labor leaders, and university presidents

A book consisting of the papers and an introduction will be published as soon as practical. Other versions of the paper, such as *Harvard Business Review* articles, may be published as well.

Senator DIXON. I thank you very much, Mr. Schacht.

And we will now hear from Mr. Richard J. Elkus, Jr., chairman, Prometrix Corp. of Santa Clara, CA.

Thank you for being with us, Mr. Elkus.

STATEMENT OF RICHARD J. ELKUS, JR., CHAIRMAN, PROMETRIX CORP., SANTA CLARA, CA

Mr. ELKUS. Thank you very much for having me here.

First of all, I want to say that I absolutely agree with the statements of the other individuals on this panel.

I'd like to approach the subject from a slightly different angle.

In my report to the committee, I used a title which I think refers back to something that was said at the very beginning of this meeting. And that is, I titled it, "Toward A National Strategy: The Strategy of Leverage."

And I'd like to explain what I mean by that.

Some comments that I made in my remarks to the committee that are in writing.

As of 1970, America was virtually self-sufficient as a nation. It encompassed the world's biggest market, produced more products and had the largest trade surplus of any nation on Earth. America's currency was one of the most solid in the world, and America's banks were the biggest.

Today, only one U.S.-owned company produces television sets; not RCA. The television market is dominated by Japan and Europe. It began here in the United States. Today, the United States is virtually a nonparticipant in the market for audio and video recording that began in the United States.

Today, the United States is no longer the largest producer or clear cut technological leader in semiconductor design and manufacture. Semiconductor design and manufacture began in the United States.

The United States surplus balance of trade in computers is less than half of what it was in 1981. Moreover, America has a negative balance of trade in computers and related products with Japan.

In a chart entitled "U.S. Report Card: Trends," the Technology Administration branch of the U.S. Department of Commerce in their spring 1990 report on 12 emerging technologies, noted that, in comparison with Japan, the United States was:

Losing badly in advanced materials, biotechnology, digital imaging technology, and super computers;

Losing in advanced semiconductor devices, high density data storage, high performance computing, medical devices and diagnostics, optoelectronics, and sensor technology;

Holding in artificial intelligence, flexible computer-integrated manufacturing; and

Gaining nowhere.

Why as a change from the position of the United States in 1970 to today been so large and why is that change, in my estimation, accelerating?

The reason for it, I believe, is as follows, and what I'm saying pertains directly to what I think should be done.

If you take a product or a market and you develop it to its logical extreme, it becomes connected with all other markets.

Take for example, oil in the Middle East. The reason we are going to war or are thinking about the possibility of going to war in the Middle East, along with many other nations, is that you have a product there which is strategic to all other products and markets around the globe. It's being denied access to the industrialized world and to the Third World countries by what we consider to be an enemy.

Under these circumstances, it becomes very clear to us that if our economies, politically and otherwise, are going to survive, they have to somehow band together in order to change the situation. These countries might be willing to go to war in order to alter the facts as they exist today.

But oil is not the only strategic interrelated market or product on this Earth. All products and markets become interrelated as you push them to their logical extreme. If you accept that, and if you walk away from an individual product or market, over time you find that you begin to walk away from all products and markets. This follows because the interrelationships that you walked away from may become absolutely essential to the markets that you're still remaining in.

So, for example, the United States developed the VCR. The VCR is essential to the market for prerecorded tape. The market of the VCR was lost to the Japanese because the United States didn't want to be in the consumer electronics business because that market looked like it had too low a gross margin, the cost versus rate of return wasn't acceptable.

At the time that the United States walked away from the VCR, total product of video recorders in the world was about 15,000 units. By 1985, that had climbed to 2.5 million units a month in Japan alone.

With that market—and by the way, there are no VCR's produced in the United States by anybody anymore—with the market of the VCR went the balance of power in the semiconductor industry. The reason for that was that the VCR turned out to be the largest single user, as an individual product, of semiconductors in the world.

When we began to lose the semiconductor industry, it began to have an effect on the computer industry, the automotive industry, all of the electronics market.

It is now projected by the Department of Commerce and others that by 1992, the United States may lag behind Japan in the electronics market. The electronics market is the largest durable goods manufacturing market in the world, and growing three times faster than any other market.

Now, the importance of what I'm saying is very simply this: technology follows markets, not the other way around. If a company in Silicon Valley develops a super technology, it does so on the basis that somehow a group of entrepreneurs can find somebody to sell that technology to, a technology which is relatively unique, and for at least some period of time, can garner a large gross margin and make a lot of money for the company.

The problem is that as the markets for those technologies and individual component products produced by these individual companies in Silicon Valley, move to areas outside of the United States, the opportunity to sell the product or technology that you're making in Silicon Valley moves offshore as well.

The result is that countries around the world are able to pick up American technology for next to nothing, because they have the end use markets, that can best use those particular technologies and products.

The danger of this is as follows:

As products and markets become interrelated, the cost of reentry once you have lost your position in those markets is very large.

Let me give you one case in point.

In the semiconductor industry, there's a company in Japan that plans to spend on research and development, \$1.5 billion on a single chip, the 64 megabit D-ram. This is \$100 million more than the entire super computer market for a year.

The reason why this company can spend that much on a single chip—and they're designing many chips—is that the end use markets that are encompassed by that company's business are so large that \$1.5 billion in the long run is nothing.

The United States defines short term in milliseconds and long term in 5 to 10 years.

Japan defines long term as forever.

The minute you understand that, the nature and the parameters of the problem change totally. It means that, as long as you stay with something, it's ultimately going to become interrelated with other products and markets and in time you will succeed. Anybody who doesn't play the game that way loses out.

So how do we solve this problem?

Without trying to go into complete details a solution requires, a national strategy. That strategy must be focused around the fact that the United States can no longer consider that it has the luxury, let alone the privilege, of walking away from products and markets with abandon simply on the basis of opportunity cost. The result of that is death to the economy.

The major change that is occurring in the balance of economic power between the United States and the rest of the world based on loss of market infrastructure is very dangerous.

I personally feel that the amount of time we have left to solve this situation before a major problem of some sort occurs is very short. I don't think we have more than 8 years, the potential time of this administration.

My feeling is this. That if you get too big a change in the competitive position of major economies in too short a time, that fact can cause individuals to react with political solutions to solve economic problems. And the result of that is anybody's guess, probably not good.

Thank you.

[The complete prepared statement of Richard J. Elkus follows:]

Council on Competitiveness

Testimony of
Mr. Richard J. Elkus, Jr.
Chairman
Prometrix Corporation

Presented to
The U.S. Senate Committee on Banking,
Housing and Urban Affairs

September 14, 1990

THE STRATEGY OF LEVERAGE

Richard J. Elkus, Jr., Chairman
Prometrix Corporation

September 14, 1990
Presented to the Senate Banking Committee,
Washington, D.C.

Summary of Testimony

The United States operates on the theory of opportunity cost: If you can make more money elsewhere, do it. Japan feels that walking away from the development of end-use products and markets based upon the strategy of opportunity cost destroys the economic infrastructure of inter-related products and markets that is fundamental to technological development. It is felt that such a strategy will only enhance the relative position of the competition.

During the 1940's and 1950's, three United States companies created industries that became the foundation for many of the strategic world markets of today. RCA was instrumental in the development of television. Shockley Transistor Company spawned the semiconductor industry. Ampex Corporation developed the field of magnetic recording. Today, television, telecommunications, computers, consumer electronics and mass media have a significant portion of their roots in the contribution of these three companies.

As of 1970, America was virtually self-sufficient as a nation. It encompassed the world's biggest market, produced more products and had the largest trade surplus of any nation on earth. America's currency was one of the most solid in the world, and America's banks were the biggest.

Today, only one U.S.-owned company produces television sets (not RCA). The television market is dominated by Japan and Europe. Today the United States is virtually a non-participant in the market for audio and video recording. Today the United States is no longer the largest producer or clear technological leader in semiconductor design and manufacture. The United States surplus balance of trade in computers is less than half of what it was in 1981. Moreover, America has a negative balance of trade in computers and related products with Japan.

In a chart entitled "U. S. Report Card: Trends", the Technology Administration branch of the U. S. Department of Commerce in their Spring of 1990 Report on twelve emerging technologies noted that in comparison with Japan, the U.S. was:

- o Losing Badly in Advanced Materials, Biotechnology, Digital Imaging Technology and Supercomputers

- o Losing in Advanced Semiconductor Devices, High-Density Data Storage, High-Performance Computing, Medical Devices and Diagnostics, Optoelectronics, and Sensor Technology
- o Holding in Artificial Intelligence, Flexible Computer-Integrated Manufacturing
- o Gaining in None.

The change in balance of economic power between the United States and Japan over the last 45 years has been staggering. In the view of R. Taggart Murphy as expressed in the March/April issue of the Harvard Business Review, "Japan today sits on the largest cache of wealth ever assembled."

Why a change of this magnitude in such a short time? Imagine that products and markets are like links in a chain. If you take a product and carry its development to a logical extreme, it becomes related to other products. For example, the optical system on a 35mm camera is similar to the optical system on a video recorder. Conversely, the electronic imaging system that is common to a video recorder is now beginning to be substituted for film in a camera.

Similarly, if you develop a market to its logical extreme, it becomes related to other markets. For example, the development of the market for VCRs made possible the market for pre-recorded videotape which is now a larger market than that of film in theatres. Conversely, if manufacturers of pre-recorded videotape choose one VCR format over another for their programming, that choice tends to influence the popularity and growth of the market for VCRs. Thus, like links in a chain, products and markets become inter-related and inter-dependent as they are developed.

In the electronics market there is one component common to virtually all electronics products - the semiconductor. Control enough links in the chain such as the markets for video recording, cameras, audio recorders, television, and computer products, and you become predominant in semiconductors. Become predominant in the design and development of semiconductors, and your prowess as a developer of other electronic products and markets increases substantially. Electronic products are fundamental to virtually every market there is. Thus, a chain of markets linked together begins to control a technological base of such significance that competitive re-entry is very difficult and expensive.

One often hears how we must improve our technological base. Technology follows markets, not the other way around. If you own the technology, but lose the market, you will lose the technology. Ampex introduced the video tape recorder in 1956 and the VCR in 1970. As a company it had a virtual 100% hold on patents in the field. Ampex decided not to pursue the VCR market. That market was picked up by the Japanese. With that market went not only the majority of video recording but a major segment of the support technologies including the design and manufacture of semiconductors.

The development of high definition products (for example, HDTV) by the Japanese represents a major improvement in the processing of large amounts of audio visual information. High definition products will touch virtually every aspect of human creativity. For example, high definition television doubles the horizontal and vertical resolution of television providing five times the visual information and as a result, spectacular pictures and sound. These advancements are made possible in part by major improvements in computer display and semiconductor technology.

Because of the breadth of applications and cost of development, no industry, technology or company will be able by itself to meet the challenge and opportunities of high definition products and systems. As the compact disk redefined the music industry, high definition products will redefine mass media. With major advances in digital technology, high definition products will redefine computers and their applications. With alternate means of transmission, high definition products will redefine the broadcast industry, shopping, medical electronics, education and banking.

As Japan introduces a full line of high definition products, it insures itself of major advancements in: cameras and recorders, fiber optics and satellite transmission systems, VCRs, computers, flat screen displays and semiconductors--all markets in which it has a major if not commanding position.

The infrastructure in electronic products and systems (now in place in Japan) will ultimately become one with that of the media and telecommunications services as the ability to process massive amounts of audio visual information increases. This is part of the reason for Sony's interest in CBS Records and Columbia Pictures.

As the Japanese position in strategic interrelated end-use markets has improved, the cost of competitive re-entry by others has often become prohibitive. This, in large part, has occurred because of the interrelated nature between products and markets. Today individual products and markets are really a combination of many interrelated technologies, components, products and markets. For example, the technology of putting pictures on tape was of supreme importance 20 years ago. But now, high levels of sophistication in digital signal processing, display technology, camera and optical know how, semiconductor technology, computer technology, high-volume fully-automated manufacturing capability and mass marketing, sales and distribution systems are required to compete in the market for video recording.

But other costs also rise. For example, the development of a semiconductor device that cost a few million dollars a few years ago may cost in excess of a billion dollars today. Similarly, the cost of a VCR facility 20 years ago would have been less than \$10 million. Today that facility might cost as much as \$600 million.

Hence, while the United States may be willing to drop a product or market on the basis of "opportunity cost" and reinvest in a more lucrative enterprise, Japan will often do just the opposite. Because of the concept of relationships between products and markets, the Japanese feel that to abandon a product or market means the potential loss of other related products and markets and, therefore, the loss of valuable infrastructure. It is this infrastructure--that is, strategically related end-use products and markets--that provides the basis for future economic growth and development. The concept of relationships and infrastructure is common throughout Japan and is fundamental to the acceptance of and necessity for long-term planning.

Assuming that the combination of the markets for electronics, telecommunications and media is the basis for entry into the information age, the following conclusion should be considered: Any significant loss of infrastructure of end-use products and markets within the area of electronics, telecommunications and media may substantially reduce the growth potential of an economy dependent upon that infrastructure. The Japanese feel, and statistics tend to bear this out, that the infrastructure represented by the markets for electronics, telecommunications and media are of major significance to the economic and political development of the United States, Japan and Europe. Lose control of one, and you may lose control of both.

Can the U.S. turn the tide in its favor? Absolutely. The U.S. computer industry is still dominant. America's position in mass media, software and transmission services is still solid. These markets can provide a basis for restoring America's competitive position. But such an effort must also include strategic moves back into consumer electronics, display systems, audio and video recording, computer peripherals, components, and related technologies. Otherwise, the combination of developments in high definition products and those markets America has lost will continue to encroach on remaining U.S. positions of strength.

One definition of chaos is fear without strategy. Rapid changes in the balance of economic power between nations without an appropriate strategy to address that change creates economic and political uncertainty. Uncertainty breeds fear.

Couple a modicum of fear with strategy and the United States can again be the most competitive nation in the world. On the other hand, allow fear to reign without strategy, and American leadership is up for grabs.

TOWARD A NATIONAL STRATEGY - THE STRATEGY OF LEVERAGE

**Richard J. Elkus, Jr.
Chairman
Prometrix Corporation**

One definition of chaos is fear without strategy. Rapid changes in the balance of economic power between nations without an appropriate strategy to address that change creates economic and political uncertainty. Uncertainty breeds fear.

Today I'd like to make two basic points:

1. Products and markets become more and more interrelated during the course of development. The interrelationship of strategic products and markets create an infrastructure that becomes very difficult to penetrate by competitors who lack positions of strength within that infrastructure. The power of an integrated infrastructure of end-use products and markets will begin to dominate technological development, intellectual property rights, component development and the educational system itself - not the other way around.
2. The United States operates on the theory of opportunity cost. If you can make more money elsewhere, do it. But walking away from the development of end-use products and markets as a strategy literally forces the competition into a position of unparalleled economic strength. This is particularly true if that competitor understands the implications of the power of an infrastructure of interrelated end-use products and markets. Such is the position today between the U.S. and Japan.

Let us consider the above mentioned points against the following background: During the 1940's and 1950's, three United States companies created industries that became the foundation for many of the strategic world markets of today. RCA was instrumental in the development of television. Shockley Transistor Company spawned the semiconductor industry. Ampex Corporation

developed the field of magnetic recording.¹ Today, television, telecommunications, computers, consumer electronics and mass media have their roots in the contribution of these three companies.

As of 1970 America was virtually self sufficient as a nation. It encompassed the world's biggest market, produced more products and had the largest trade surplus of any nation on earth.

Today only one U.S. owned company produces television sets (not RCA). The television market is dominated by Japan and Europe. Today the United States is virtually a non-participant in the market for audio and video recording. Today the United States is no longer the largest producer or clear technological leader in semiconductor design and manufacture. The United States surplus balance of trade in computers is less than half of what it was in 1981. Moreover, America has a negative balance of trade in computers and related products with Japan. Loss of market positions in these strategic areas has begun to restrict America's control of its economic and political destiny.

These circumstances are summarized by the United States Department of Commerce International Trade Administration as it assessed the competitive status of the U.S. electronics sector from materials to systems:

The U.S. electronics sector has been historically and remains today the overall leader in the world by many measures. In terms of output, employment, innovation, and technology base, the United States is number one. However, in terms of the growth of these measures and others, such as exports, Japan and Korea are quickly reducing the U.S. advantage. In fact, if current relative growth rates continue, the Japanese will be the world's number one electronics producer and trader by the early 1990s.²

¹Rosenbloom, Richard S., Freeze, Karen J. Ampex Corporation and Video Innovation. Division of Research Graduate School of Business Administration-Harvard University; 1985, 185.

² Report From the Secretary of Commerce to The Appropriations Committee U.S. House of Representatives, U.S. Department of Commerce International Trade Administration. The Competitive Status of the U.S. Electronics Sector, From Materials to Systems, Executive Summary. 1990 April; pg. x.

The Department of Commerce statement is consistent with comments made in a speech that I gave on July 9, 1988, based upon data from Cahners and Dataquest.

Electronics is now the largest durable goods manufacturing industry in the United States and is growing three times faster than other manufacturing.

The worldwide electronics market has become a mammoth business with a compounded growth rate approaching 9%. However, the projected growth rate for the electronics market in Japan is expected to be 40% greater than that of the United States.

Finally, in a chart entitled "U.S. Report Card: Trends" the Technology Administration branch of the U.S. Department of Commerce in their Spring of 1990 Report on twelve emerging technologies noted that in comparison with Japan, the U.S. was:

Losing Badly in Advanced Materials, Biotechnology, Digital Imaging Technology and Supercomputers.

Losing in Advanced Semiconductor Devices, High-Density Data Storage, High-Performance Computing, Medical Devices and Diagnostics, Optoelectronics, and Sensor Technology.

Holding in Artificial Intelligence, Flexible Computer-Integrated Manufacturing.

Gaining in None.³

The impact of the strategic development of an infrastructure of end-use products and markets on the financial prowess of Japan has been nothing short of remarkable.

³ U.S. Report Card: Trends. Emerging Technologies, A Survey of Technical and Economic Opportunity. Technology Administration, U.S. Department of Commerce. Spring 1990. xiii

At the end of the second World War, Japan was a defeated nation. Under the aegis of General MacArthur, the Zaibatsu (major groups of inter-related companies) was systematically disassembled. Food was in very short supply and very expensive. Living conditions were difficult at best. Industrial output was basically at a stand still. Much of the country had been razed by the ravages of war.

The United States of America, on the other hand, came out of the war virtually intact. Economically and militarily, it was the strongest nation in the world. Its military might and economic prowess had reached heights greater than any nation had achieved in history. For many years after the war much of the world was to depend upon the United States for financial support, food, and military protection. Japan was no exception. But things are different today.

Approximately forty five years later, the change in economic position between the United States and Japan has been staggering. In 1989, R. Taggart Murphy wrote:

Japan today sits on the largest cache of wealth ever assembled. It has the power to move markets anywhere in the world. Consider that: The Tokyo Stock Exchange has now surpassed New York to become the world's largest on the basis of market capitalization. Osaka has bumped London to fourth place. Of the world's ten largest banks, nine are Japanese. If deposit size is the unit of measurement, no U.S. bank makes it into the top 25. Japanese investors' appetite is the key determinant of the price of U.S. Treasury bonds. Japanese and Japanese-owned banks now supply more than 20% of all credit in the state of California. The market value of Japan, as measured by an extrapolation of real estate prices, exceeds that of the United States. The market value of the Imperial Palace grounds in central Tokyo is said to exceed that of a number of entire U.S. states.⁴

⁴ Murphy, R. Taggart. The Crisis of Japan's Global Financial Dominance. Harvard Business Review. 1989 March-April; Number 2: 71-83.

And, as David Hale noted, "Japan's top 13 banks are worth \$470 billion. America's top 50 are worth \$110 billion."⁵

By the end of 1989, the capitalized market value of Nippon Telephone and Telegraph Corporation (NTT) was greater than the total capitalized value of all the stocks on the West German Stock Exchange. According to Albert J. Alletzhauser, author of The House of Nomura, one company, Nomura Securities, has grown to such an extent that "on some days Nomura's share of New York Stock Exchange volume has exceeded 5% and Nomura Securities has taken up as much as one quarter of newly issued United States Treasury Bonds."

On October 19, 1987, the New York Stock Exchange experienced a major crash that affected the entire financial world. The New York Stock Market dropped 508 points or 23%. The world wondered if it could withstand such a financial blow and survive intact. On October 20, a member of the Ministry of Finance, Takashi Matsukata, indicated to the four major securities firms in Japan that they should act in concert to stem the pending collapse. The purchasing power of these firms began to reverse the tide of sellers, first in Tokyo and then in the rest of the world. The drop on the Tokyo Stock Exchange was held to 15%. By Wednesday, October 21, a full-fledged rally on the Tokyo Stock Exchange had ensued and continued through 1989.⁶

In summary, the infrastructure of end-use products and markets developed within the Japanese economy appears to be increasing Japan's technological base at a faster pace than that being achieved within the United States. In addition, improving strength in end-use products and markets appears to be having a very favorable effect on the overall economy of Japan.

Virtually all of the technologies, products and markets mentioned above will be augmented by and in turn contribute to the growth of high definition products

⁵Hale, David D. Global Finance and the Retreat to Managed Trade. Harvard Business Review. 1990 January-February; 150-162.

⁶ Alletzhauser, Albert J. The House of Nomura: The Day Nomura Helped Save the World. New York: Arcade Publishing; 1990, pp. 1-22.

and systems. Therefore, it is important to try to understand why there has been such a change in economic and industrial power between the United States and Japan in such a short time. The answer, in part, according to those interviewed can be found in the strategy implicit in the development of high definition products and systems.

1.3 JAPANESE ECONOMIC STRATEGY

The following comments are based upon my experience in dealing with major corporations, business and government leaders in Japan over the past twenty-two years. This experience included circumstances occurring between 1968 and 1972 that are now directly related to the current developments in high definition products and systems including: Preparation of the product plan approved by the president and board of directors of Ampex Corporation for the initial development of the VCR, and management of the program to design and develop America's first entry into the world of the VCR.⁷

To the Japanese businessman, strategy is everything. Every person, every business, every industry must have a goal and a strategy to achieve it. Since resources are usually scarce, the successful Japanese plan includes the concept of leverage. Therefore, some markets are given a high priority and are considered more strategic than others. By targeting strategic markets, an infrastructure can be built which insures a solid basis for economic expansion. The leverage, however, is not based simply on the importance of one market over another, but on the assumption that over time and with development, strategic markets will become interrelated and interdependent, with the whole becoming substantially larger than the sum of its parts.

⁷Rosenbloom, Richard S. Research on Technological Innovation Management and Policy. Jai Press: Greenwich, Connecticut; Volume 2, 1985, 224.

Diebold, John. The Innovators The Discoveries, Inventions and Breakthroughs of Our Time. E.P. Dutton: New York; 1990; 303.

INTERRELATEDNESS OF END-USE MARKETS

In the United States we tend to approach products, markets and businesses as separate enterprises, like independent circles, with little emphasis on and few mechanisms for coordinating overall strategy and direction. These separate enterprises are often treated as profit centers. If the profit isn't adequate, the enterprise is often reorganized or disbanded in favor of a more profitable situation.

The Japanese, on the other hand, regard products, markets and businesses as interrelated and interdependent enterprises, like links in a chain; they, therefore, feel that the coordination of strategy and direction is essential. This is a point that is fundamental to the strategy of product and market development in Japan. It is based on the concept that if you push the development of a product or market to its logical extreme it becomes related to other products and markets. Thus in Japan, rather than reject a product or market on the basis of profit potential, business strategy assumes that every product becomes the basis for another; every technology becomes the stepping stone for the next, and the resulting efficiencies of scale are enormous.

There are numerous areas in which one can see this principle at work. Following are several examples:

PRODUCTS There are obvious relationships between the optical systems of a video and a 35 mm camera. Similarities also exist in the electronic packaging and circuit design of VCR camcorders, 35 mm cameras, portable audio recorders, portable CD players and television sets. The newly introduced digital audio tape recorder is a derivation of the VCR.

MARKETS The development of the VCR created the market for pre-recorded tape, a market now larger than film in theaters. Similarly, the market for pre-recorded tape directly influences the potential success of a video or audio recording format (for example, Beta versus VHS).

COMPONENT TECHNOLOGIES The development of a major position in a strategic end-use market (for example, the market for VCRs) provides a primary

source of demand for key components and technologies related to the development of these markets. The VCR has become a huge source of demand for semiconductors. In 1987, the VCR alone represented nearly 5 percent of worldwide semiconductor demand, and almost 12 percent of semiconductor production in Japan.

The semiconductor device provides the basic computing power and information storage capacity for most modern electronic products; as such, it is probably the single most important strategic electronic component. Japan has, therefore, felt it essential to develop and maintain a large presence in the semiconductor industry, including participation in materials, equipment and devices - not, however, through random investments. The development of the semiconductor industry is driven principally from demands and funds generated by related end-use markets for products such as that of the VCR, audio recorders, video cameras, 35mm cameras, television sets, fax machines, computer products and automobiles (all markets in which the Japanese have major positions). The prevailing philosophy of Japanese industry is that significant positions in strategic interrelated end-use markets, such as those mentioned above, provide an equally significant position in the semiconductor industry. Conversely, a significant position in the semiconductor industry will lead to domination of innumerable end-use markets not necessarily limited to the field of electronics.

PRODUCTS AND SYSTEMS FOR THE FUTURE

Matsushita Electric Corporation produced a book in English and Japanese entitled Human Electronics - Matsushita Electric Exhibition of Technology - Technical Report. This book outlines products and systems under development for future sale and use. The book, presented to me by Matsushita in June of 1989, includes the following sections:

1. Key Technologies for AV & CC
 - a. Displays
 - b. Semiconductors
 - c. Computers
 - d. Communication Systems

2. AC & CC for Living and Society
 - a. Home HDTV Systems
 - b. Home AVCC Systems
 - c. Information and Communication Systems for Automobile
 - d. Learning Systems
 - e. Office Systems
 - f. High Definition TV Studio
 - g. AV Studio
 - h. High Definition Video Theater
 - i. Home Auditorium
 - j. Digital Audio Car
3. Consumer Electronics Technologies
 - a. Video and Audio
 - b. Housekeeping and Cooking
 - c. Air Conditioning
4. Fundamental Technologies
 - a. Lighting
 - b. New Materials
 - c. Sensors
 - d. Memories
 - e. Electronic Components
 - f. Batteries
 - g. Electronic Components in Automotive Applications
5. Production Engineering Technologies
6. Plant Biotechnology

The breadth of the development programs represented in this book is indicative of how one firm in Japan (Matsushita) looks at the interrelated aspects of various products and market areas. The following pages include an overview of two sections: Information and Communication Systems for the Automobile and the High Definition TV Studio. The purpose of these exhibits is to illustrate the following points:

1. From the Japanese stand point, products and markets become interrelated as they are developed. For example it is contemplated that the communications system in the automobile will be used to control electronic products in the home including garage doors, microwave ovens, air conditioning, and alarm systems, as well as fax machines and computers.
2. High definition television is only one aspect of the market for high definition products and systems. In reality, high definition products and systems, in time, will affect most products and markets as the requirement for and ability to process tremendous amounts of information increases.

Accompanying the two sections is a copy of an ad that appeared in several magazines including a special issue of Fortune Magazine in the Fall of 1989. This ad by Matsushita Corporation is derived from the section on "Information and Communication Systems for the Automobile" included in their technical report as noted above.

The reason for its inclusion in this report is to add clarity to the concept of inter-relationship between products and markets espoused by the Japanese not only within the management of their development programs but included in everyday literature as a part of their sales and marketing efforts.

車載用情報システム

Information and Communication Systems for Automobile

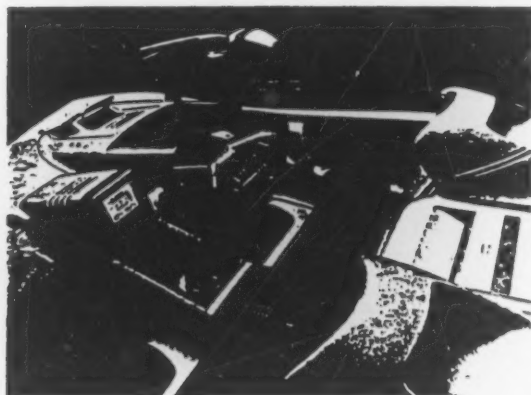
松下電器のめざすものは、情報化時代に対応する安全・快適なカーライフです。それは、インテリジェント化され、さらにヒューマンな、もっとコミュニケーションを大切にした、ビジュアルコミュニケーションカーへの対応です。

ここでは、AV & CC技術を駆使した、ナビゲーションや音声認識ハンズフリー電話・テレコントロール、さらにはファクシミリでそれぞれ、社会、家庭、オフィスと有機的につなぐとともに、テレビ・ビデオデッキも含めた車載用情報システムとして、これからの新しいカーライフをご紹介します。

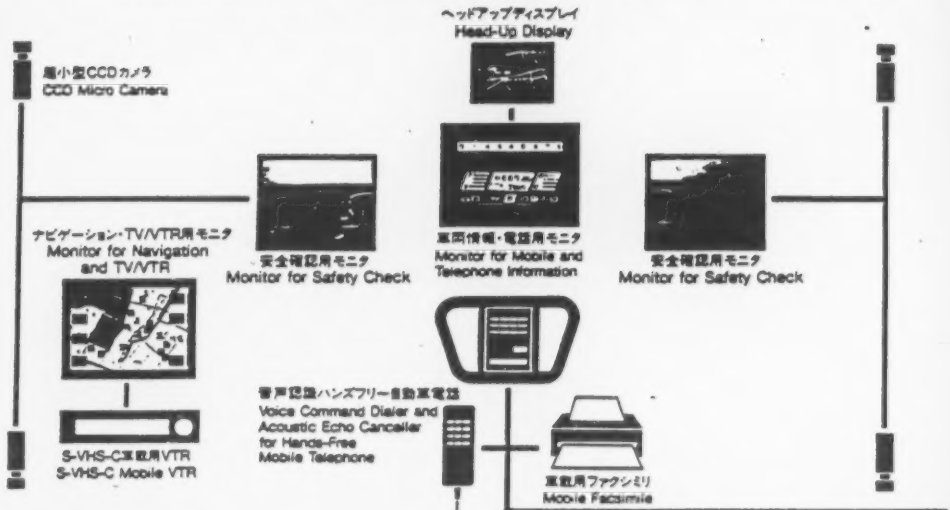


Agreeable automobile travel fully in tune with the coming information society age is what Matsushita aspires to offer the driving public; and this can be achieved by merging safe, practical visual communication systems within the automobile.

Displayed here are examples of information systems for use in your car now and in the future, which include; a navigation system, a voice command dialer and acoustic echo canceller for hands-free mobile telephone and tele-controller, a facsimile machine and video deck—all of which make full use of existing AV & CC technologies.



車載用情報システム解説 Information and Communication Systems for Automobile



システムの特長

■社会システムに対応したナビゲーション

現在位置と目的地を入力すると、ディスプレイ上の道路地図に最短経路が示されます。また、リアルタイムで入ってくる交通情報に基づいて、迂回路の誘導も表示されますので、特に年々、交通の過密化が進む都市部においては、効率的なドライブを実現します。

■CCDカメラによる車周囲の確認

超小型CCDカメラにより、車両前方左右と後方の左右の状況をとらえ、モニタ画像で確認できるので、安全・快適なドライブを実現します。

■オフィス・家庭とつながる情報・通信機器

自動車電話、車載用ファクシミリにより、オフィスと情報のやり取りをし、本格的なカーオフィスを実現します。また、車内から電話によるテレコントロールで家庭内の機器操作を可能にしています。さらに、自動車電話は、音声認識によるダイヤルとハンズフリー通話が可能のため、ステアリングから手を離すことなく安全なドライブを実現できます。

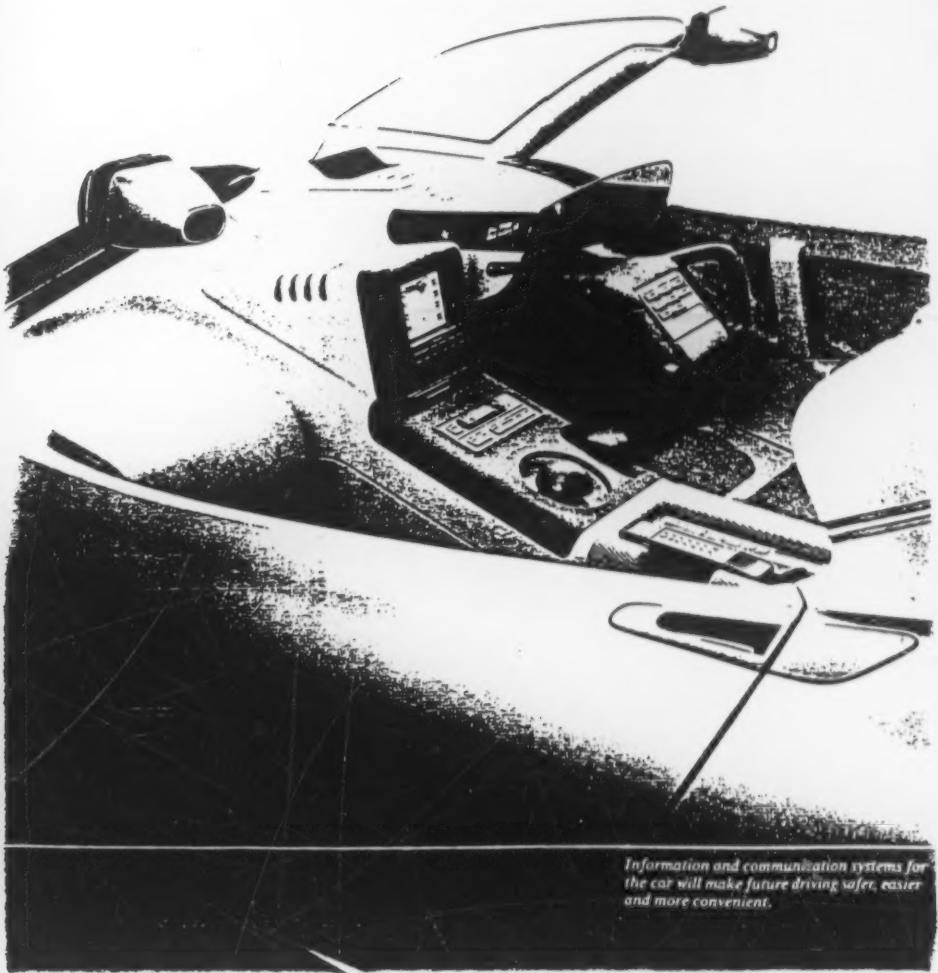
■ヘッドアップディスプレイ

スピードメータ、ウインカ、道路地図などの情報をフロントガラス面に、運転に支障がないように虚像画面と

Features of the system

1. The best navigable route instructions, derived by inputting present location and inter destination. Traffic congestion and current construction information offers re-routing possibilities as a portion of the communication.
2. Constant surveying of the immediate surrounding of the car performed by a CCD camera confirm safety conditions.
3. Information and communication equipment including telephone, facsimile, and remote controller which connects the car to office home.
4. Windshield information display aiding the driver to keep eyes on the road for safety.

Human Electronics—Technology for the Benefit of Mankind



Information and communication systems for the car will make future driving safer, easier and more convenient.

Put eyes in the back of your head. A navigation system in front of your nose. A telephone and fax in the middle of everything.

A map pinpointing traffic jams flashes across your car's video monitor. Another monitor shows you right, left and rear views. All this as well as a voice command phone and mobile fax are but a few of the advanced electronic systems that Matsushita Electric is working on today, to make driving safer, easier and more convenient tomorrow.

You're late for work, heading toward a traffic jam and there's nothing you can do about it. In the future, this may not be a problem because of the advanced automotive electronic systems under development at Matsushita.

VISUAL INFORMATION SYSTEM

Should you take the highway or the boulevard? Or maybe the back roads? Someday, your car's navigation system will take care of all that. A navigation map will show you traffic jams on a sophisticated video screen and show you exactly where you are. So you can choose the fastest, most efficient alternate route.

Today, you glance down to see the speedometer, up for the rear view mirror, left and right for side views. Matsushita is working on a system that will replace side and rear view mirrors

with video cameras and monitors. And a unique Head-Up Display located in your line of sight will show you speed, fluid levels and a map. So you should never have to take your eyes off the road.

THE COMMUNICATIONS CENTER

To make your time on the road more productive, Matsushita is developing a mobile fax that will connect your car to your office, home and beyond. A voice command mobile phone lets you call anyone by simply saying his name out loud. In any pre-programmed language. And linked with Matsushita's home automation technology, the sound of your voice will lock or unlock the front door of your home, turn on the microwave oven or turn on your air conditioner. All from your car.

HUMAN ELECTRONICS

Advanced electronic systems like these are an example of how Matsushita Electric is devoted to the concept of Human Electronics. Matsushita's objective is to research, develop and market products that make life richer, safer and more comfortable. These products are sold under the brand names Panasonic, Technics, Quasar and National. In 1988, Matsushita's consolidated sales volume surpassed \$41.7 billion. All a direct result of a single-minded philosophy: Don't create new technology for technology's sake, but for man's sake.

MATSUSHITA ELECTRIC
PANASONIC TECHNICS QUASAR NATIONAL

ハイビジョンスタジオ

High Definition TV Studio

将来は3兆円市場に成長するといわれているハイビジョン。最大の市場はテレビ放送関係、特に家庭用の受像機になることは確実ですが、デジタル化による多彩な画像処理と色調の忠実な再現性によって、映画、印刷、出版、医療など、テレビの領域を超える映像分野や、精緻な芸術性が要求される分野での利用にも大きな可能性を持っています。

このコーナーでは、ハイビジョン放送用のスタジオシステムおよび幅広い分野での活用が考えられるさまざまなハイビジョン関連機器をご紹介します。



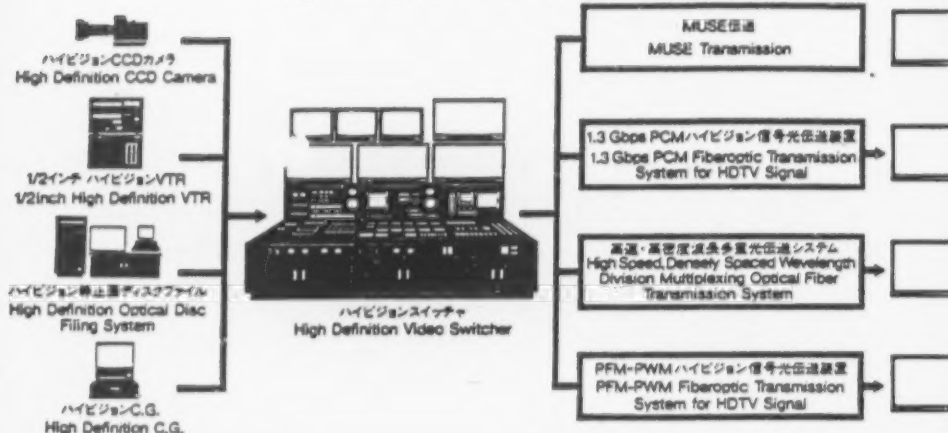
It has been said that High Definition TV would create a 25 billion dollar industry in the future, dominated primarily by the TV broadcasting market principally utilizing home TV receiver units. However, benefiting from the versatility of picture processing technology and by virtue of its capability for excellent color reproduction, High Definition TV has endless possibilities.

The vast range of possibilities for High Definition TV include, in addition to video; movies, printing, publishing, medical treatment, and a host of other areas where a high degree of artistic skill is required.

Presented in this corner is an example of a High Definition broadcasting studio system, as well as samples of High Definition related equipment to be used in some of its possible fields of application.

ハイビジョンスタジオシステム解説

High Definition TV Studio Systems



システムの特長

- ハイビジョンCCDカメラ
130万画素FIT-CCDを使用した3板カラーカメラ。高品質画像が得られます。
- 1/2インチハイビジョンVTR
M-II VTRの技術を基本にした高性能VTR。当会場の家庭用HDTVシステム、ディスプレイの信号送出にも使われています。
- ハイビジョン静止画ディスクファイル
1画面4秒以内の高速画像表示が可能。スキャナによる画像入力や、プリンタでハードコピーも行なえます。
- ハイビジョンC.G.
高品位の文字・図形をリアルタイムに送出するハイビジョン用Character and Graphic Generation System。
- ハイビジョンスイッチャ
ハイビジョンスタジオの中核システムとして、映像の加工に大きな効果を発揮します。

Features of the System

1. High Definition CCD Camera
A color camera that employs three 1.3 million pixel FIT-CCDs.
2. 1/2 inch High Definition VTR
A high performance VTR that was developed based upon the M-II format VTR technology employed for transmitting home HDTV system and display signals.
3. High Definition Optical Disc Filing System
This system makes practicable high speed picture displays at the rate of one still frame every four seconds, use of a scanner for picture filing and production of hardcopy by utilizing printer function.
4. High Definition Character and Graphic Generation (C.G.) System
Real-time transmission of High Definition characters and figures using the character and graphic generation system is another example of versatility of this High Definition studio system.
5. High Definition Video Switcher
At the heart of High Definition TV studio systems is the High Definition Video Switcher performing the core function of processing the video signals received and making them compatible with the system.

STRATEGIC NATURE OF ELECTRONICS MARKETS

The Japanese feel that a strong participation in strategic interrelated end-use markets will have as important an influence on technology in general as it has on the technology of semiconductor products in particular. In other words, their view is that domination of strategic interrelated end-use markets will lead to the domination of the use and direction of technology, not the other way around. This relationship is borne out by the Japanese experience. The Japanese now dominate or have a significant position in the following markets:

1. The videotape recorder market, including professional, commercial and consumer applications
2. The video camera market, including professional, commercial and consumer applications
3. The 35 mm camera market
4. The consumer television receiver and monitor markets
5. The consumer and commercial audio recorder markets
6. The compact disk playback system market
7. The video disk market
8. High speed digital fiber transmission equipment
9. The optical disk market
10. The market for digital watches and solar-powered calculators, radios and television sets
11. The market for P.C.'s, workstations and lap-top computers

Based upon its position in the above markets, Japan has gained a preeminent position in the development and production of optical systems and devices, displays, semiconductors, semiconductor equipment, semiconductor materials and various components of mass memory systems. Japan's overall market position has improved dramatically as it pushed the development of specific end-use products to their logical extremes.

COST EFFICIENCY OF RETAINING MARKETS

At the same time, the cost of competitive entry (or re-entry) into strategic markets (such as the VCR market) has escalated dramatically. For example, the development of a semiconductor device that cost a few million dollars a few years ago, may cost in excess of a billion dollars today. Similarly, the cost of a VCR facility 20 years ago would have been less than \$10 million, whereas today that facility might cost as much as \$600 million. Other costs also rise largely due to the interrelationships that exist today between technologies, components, products and markets. While participants in the video recording market 20 years ago could concentrate almost exclusively on the technology of putting pictures on tape, they must now possess high levels of sophistication in a host of interdependent products and fields: digital signal processing; displays, cameras and optics; semiconductors; computers; high-volume, fully-automated manufacturing, and mass marketing and distribution. Moreover, the trend is now towards convergence between the VCR and media industries, adding yet another dimension to start-up costs.

In an article entitled "Loosing Control (Auto Industry Is Sliding Relentlessly Into Japanese Hands)," Paul Ingrassia stated:

By moving from exporting cars to the U.S. to building them in the American heartland, the Japanese are steadily taking over the American car industry. It is one of history's great transfers of industrial wealth and power.⁸

A similar article appeared in The Economist on April 14, 1990. This article, entitled "Detroit Under Siege" noted that:

As recently as 1978 the Big Three made 82% of the cars sold in their all-important American market. Today they have just 67% of American

⁸ Ingrassia, Paul. "Loosing Control (Auto Industry in U.S. Is Sliding Relentlessly Into Japanese Hands. The Wall Street Journal; Friday, 1990 February 19; A1 & A6.

sales, a slide which most market analysts expect to accelerate over the next four years.⁹

Why is this happening? These articles talk about Japanese knowledge in producing efficient small engines. They discuss the inefficiency of the large automobile corporations in the United States. They talk about the large investment in research and development by Japanese corporations in the automobile industry. But, something else is also happening.

In the past, approximately 5 percent of the cost of an automobile had been based upon electronic components and systems. Many technical experts now project that 30 to 35 percent of an automobile will be comprised of electronic components and systems by the mid 1990's. As is suggested in the commentary by Matsushita under the heading "Information and Communication Systems for Automobile," the infrastructure for end-use products and markets in the electronics sector of Japan is becoming a significant part of the infrastructure of the automotive industry. Technical advances in radios, sound systems, mobile telephones, fax machines, satellite communication systems, displays, video recorders, cameras and semiconductors are rapidly becoming fundamental to the automobile of the future. Over time, U.S. companies have found many of these product areas less profitable than others, and on the theory of opportunity cost have shifted their resources elsewhere. Today these products and markets are becoming increasingly dominated by the Japanese and manufacturers in other countries. Hence, American automobile firms often find it necessary to buy electronic components and systems from suppliers strategically more closely associated to their competition than to themselves. Lack of strong strategic relationships with appropriate electronic component and equipment suppliers may significantly reduce the overall competitiveness of U.S. car manufacturers by limiting their design and performance specifications let alone cost.

As products and markets evolve, the technological improvements increase the sophistication of those products and markets in startling ways. In that regard, at the conclusion of the National Science Foundation Panel on high definition

⁹ The Economist. April 14, 1990. pp. 13 & 14.

products and systems trip to Japan in June of 1969, Mr. Lawrence E. Tannas, Jr., a member of the panel and then president of the Society for Information Displays, said that in his opinion the sophistication of display and electronics packaging techniques incorporated in consumer products on the store shelves in Tokyo was in many cases equal to or better than the display and electronics packaging techniques produced by the Department of Defense. In a way, Mr. Shintaro Ishihara, in his book The Japan That Can Say "No", alluded to these differences by commenting on the Soviet and U.S. dependency on the superiority of Japanese technology for certain strategic weapon systems.

Thus, while firms in the United States may be willing to drop a product or market on the basis of "opportunity cost" and reinvest in a more lucrative enterprise, Japanese firms usually will not. Because of their concept of relationships between products and markets, the Japanese feel that to abandon a product or market means the potential loss of other related products and markets and, therefore, the loss of valuable infrastructure. It is this infrastructure of strategically-related end-use products and markets that provides the basis for future economic growth and development. The result of the Japanese economic strategy to target and dominate certain strategic interrelated end-use markets is to significantly reduce the threat from any competitor attempting to enter a market or gain market share on the basis of a technological breakthrough or some special expertise.

LONG-RANGE PLAN FOR HIGH DEFINITION PRODUCTS AND SYSTEMS

Defined in its broadest terms, high definition technology encompasses the production, transmission, recording, processing and display of ever-increasing amounts of audio-visual information. The market for high definition products and systems can, therefore, help push the markets for electronics products, telecommunication services, and software (including mass media) to their logical extreme. The Japanese feel that in time, perhaps by the year 2000, the requirements and possibilities created by improving the technology of rapidly processing huge amounts of audio-visual information will force a confluence of these three end-use markets into a single information systems market. They expect that the information systems market will, within the next ten years, represent 33 percent of all capital investment, 44 percent of all new jobs and 22

percent of all economic growth. The Japanese further anticipate that the information systems market will evolve into an information-based economy, which in turn will help bring about an advanced social order.

In a 1989 brochure entitled Advanced Television. The Promise And The Challenge, the Japanese Ministry of Posts and Telecommunications stated that:

We live in a society of transition. A society which is abandoning its past obsession with materials and energy to make room for a new allegiance to information and knowledge. As the advanced information society resulting from this change in emphasis matures, the uses and services connected with the products and material objects will gain precedence over their mere possession. In the process, the distortions arising from the concentration of population and industry in the large cities and our industrial society will be resolved. Tomorrow's city dwellers will share access through the media to information of all types. National and local governments and private enterprise must all work together to create this new society aimed at enabling people to lead richer lives both materially and spiritually.¹⁰

Thus far, advances in information processing, centering on computer and networking technologies, have been mainly in the domain of sound and symbols (data and alpha-numeric characters). From now on, however, these will be joined by advances in the visual media as the latter gradually come to form the core of social activity.

1.4 EFFECTIVENESS OF THE JAPANESE STRATEGY: A CASE STUDY

AMPEX AND SONY--HISTORY AND COMPARISON

A significant portion of the transition referred to in the Ministry of Posts and Telecommunications brochure will occur because of products and technologies

¹⁰Advanced Television (ATV) The Promise and the Challenge. Report from the Ministry of Posts and Telecommunications Simul International Productions. Tokyo, Japan: 1989; 39.

initially developed, produced and marketed by two companies -- Ampex Corporation of the United States and Sony Corporation of Japan. Since the late 1950's, the relationship between Ampex and Sony has been one of both cooperation and competition. Although Sony's early growth was tied to its development of the "pocket radio," it was Ampex's pursuit of magnetic recording, and in particular, its development of the videotape recorder, that became the cornerstone of growth for both firms.

At the time of its introduction in 1956, few could perceive the change that Ampex's development of the videotape recorder would bring to mankind. Ampex, Sony and other companies have derived innumerable new products and technologies from the early VTR technologies. In combination, these technologies have affected lifestyles, communications, economics and even politics throughout the world. Together, they now constitute much of the foundation for the development of high definition products and systems, the basis of what the Japanese today call the "New Media." Together they are pushing society into an "information age." And despite the fact that the initial development of these critical products and technologies occurred primarily in the United States, today they are dominated by electronics companies in Japan. It thus seems worthwhile to review a bit of Ampex and Sony history.

In 1946, Sony Corporation of Japan commenced development of products in the commercial marketplace under the leadership of Masaru Ibuka and Akio Morita. In that same year, Ampex, a small U.S. corporation led by Alexander Pontiatoff, was reviewing the possibility of magnetic recording as demonstrated in the design of a German audio tape recorder. In its early years, Sony attempted to establish a position in the design, production and marketing of transistor radios the technology of which was initially developed by Dr. Shockley of Bell Labs. Ampex meanwhile had entered the commercial marketplace with the magnetic tape recorder. At first Ampex's developments were strictly in the area of audio recording. However, in 1956, a technical group under the direction of Charles Ginsburg at Ampex completed the development of a device that was to change the course of history - the videotape recorder. With the first recorded reflections on the television screens at the convention of the National Association of Broadcasters in 1956, the world learned of the preeminence of Ampex technology.

As Ampex worked to improve its videotape recorder, it saw a need for solid state devices in place of vacuum tubes. At the same time, it wished to manufacture and market its recorders in Japan, and Japanese regulations required it to have a Japanese partner. Sony, under a license from Bell Labs for use of certain semiconductor technology, had developed a proficiency in electronics packaging techniques, and it appeared to be the logical partner for Ampex in both situations. As a result, in 1960, Ampex and Sony entered into a simple partnership that effectively traded Sony's understanding of electronic packaging technology for Ampex's license to manufacture videotape recorders in Japan.

But 1960 marked the first of several major fiscal crises for Ampex. With the financial reversal of 1960, Ampex received a new management team. The leader of that team (William Roberts) felt that the technological exchange with Sony would be detrimental to Ampex's long-term growth. As a result, Ampex broke off its technical exchange and manufacturing agreement with Sony, but granted to Sony a license to build helical scan non-broadcast videotape recorders.

By 1960, Sony and Ampex, both actively involved in the field of audio and video recording, had embarked on different strategic paths. Sony continued to maintain a philosophical commitment to push the development of a product to its logical extreme. This process began to demonstrate obvious inter-relationships between its products and markets. As product specifications improved, their size and weight declined and reliability increased, the line between consumer and commercial markets began to blur. Sony's sales expanded accordingly.

Ampex, on the other hand, tended to concentrate on a specific technological advantage in order to maintain a given market niche and related profit margins. Ampex's technology was obviously applicable to a broad range of products and markets. Yet, the implications of the interrelationship and interdependence of its products and markets was never clearly understood since there was no established strategy for pushing the development of those products and markets to their logical extreme. Consequently, Ampex was constantly faced

with the decision whether to enter, remain or leave a market simply on the basis of a competitive threat and its potential effect on near term profits.

From 1960 - 1970 the market for video recording grew, but remained relatively small (approximately \$200 million and 16,000 units in 1970). The largest dollar portion of that market represented video recorder equipment for the broadcast industry utilizing a transverse scanning recording format. A smaller, but growing portion was made up of videotape recorders and accessories for closed-circuit television based on a helical scan recording format and used principally for industrial and educational applications. The bulk of the unit volume of these closed-circuit systems were reel-to-reel recorders, produced by Japanese companies under license to Ampex. However, Ampex remained the predominant producer of videotape recording equipment, representing as much as 75 percent of the total market (in terms of dollars).^{11 12} During that same decade, the market for audio recorders and 35 mm cameras grew quite rapidly. Due to their strategic planning and industrial electronic packaging expertise, the Japanese were becoming a major factor in both these markets.

Three events in 1970 set the stage for a fundamental change in parity between the industrial complexes of the United States and Japan:

1. Ampex introduced a product called Instavideo, the world's first entry into what was to become the VCR market. Through its joint venture partner, Toshiba, Ampex was participating with other Japanese firms in a continuing series of discussions aimed at establishing a VCR recording standard.
2. By the end of 1970, significant disproportional growth in inventory and receivables investment began to severely constrain Ampex's cash position.

¹¹ Elkus, Jr., Richard J. Introducing The Instacorder. Ampex Corporation Report. 1968 November 12. (Unpublished)

¹² Rosenbloom, Richard S. Research on Technological Innovation Management and Policy. Jai Press: Greenwich, Connecticut; Volume 2, 1985, 224.

3. NHK, the National Broadcast Network in Japan, began a significant program for development of a direct broadcast system for high definition television (called MUSE).

By 1972, Ampex once again underwent a major reorganization for financial reasons, and as a result, it halted further investment in the Instavideo program. Ampex executives felt at that time that they didn't belong in consumer video markets but wished to concentrate on the broadcast industry where margins and profit potential based on past performance were reasonably secure. At the same time, the market for broadcast and closed circuit video recording was beginning to be affected by the introduction of new and improved helical video recording systems from Japan, including the Sony U-Matic cassette recorder. Although the size, weight and cost of the U-Matic system precluded a mass market, it was an indication of things to come. Other systems that followed were Sony's Betamax VCR system in 1975, the VHS VCR systems produced by Matsushita and a number of other Japanese companies.¹³ Note: Ironically, the introduction of the system by Sony was aided in part by Ampex engineers who had formerly been employed on the Instavideo program and were hired by Sony after the cancellation of Instavideo.

By 1985, the videotape recorder market primarily due to VCR production was worth \$15 billion. VCR production in Japan had reached a rate of 2.5 million units a month. What's more, helical scan technology had become the method of choice for video recording in the broadcast industry. With the VCR came the new, potentially more far-reaching market of pre-recorded tape. For the first time, the media was able to bypass telecommunication services and reach the consumer directly through the mass distribution of pre-recorded tapes. The market for pre-recorded tapes in the United States eventually surpassed the total market for films in theaters. The world of audio/visual communications would never be the same again; perhaps more importantly, the development, manufacture and marketing of consumer electronics products like the VCR were no longer dominated by the United States of America. By 1985, Ampex sales amounted to less than 2 percent of the worldwide market for video tape recorders.

¹³ Rosenbloom, Richard S. *Research on Technological Innovation Management and Policy*. Jai Press: Greenwich, Connecticut; Volume 2, 1985, 224.

SONY TODAY

The National Science Foundation panel on high definition systems met with many Japanese companies involved in the production of high definition products; all of the products were impressive. As advanced as any group of products we saw in Japan, were the array of high definition systems produced by Sony. Sony's Chairman, Mr. Akio Morita, and various other members of the management team made it quite clear that the videotape recorder was a fundamental part of the growth and development of Sony's business. This is particularly noteworthy when one begins to get an idea of Sony's comparative size and direction, as revealed in its 1988 annual report:

1. Total sales for fiscal year 1988, not including those of recently purchased CBS Records, amounted to approximately \$11.6 billion.
2. The 1988 annual report revealed that the \$2 billion CBS Records acquisition "... was financed by short-term loans, commercial paper issued in Japan, and internal funds. This short-term debt was refinanced in April, 1988, when we issued 20 million new shares of Common Stock and ¥92 billion (\$736 million) of 1.4% unsecured convertible yen bonds through public offerings in the Japanese market. These capital procurement activities raised a total of about ¥200 billion (\$1.6 billion) ..."
3. Before the refinancing, Sony's debt to equity ratio was less than two to one.
4. Sony's reasons for purchasing CBS records were described in these terms: "As a subsidiary of Sony, CBS Records is expected to contribute significantly to the corporate growth, enhancing our audio/visual strategy by enabling us to jointly develop the hardware and software segments of the market". Note: But the purchase of CBS records by Sony probably also contributed to a change in receptiveness on the part of the United States recording industry to the importation of digital audio tape recorders from Japan. These

products, based in part on the helical scan concept of the VCR, were considered a threat to the U.S. recording companies because of the potential for pirating vault-quality media available on compact disks. Sony produces digital audio tape recorders.

5. By 1988, Sony had become a major producer of computer workstations.
6. In 1989, Sony purchased Columbia Pictures for \$3.4 billion, and also Materials Research Corporation, a major manufacturer of sputtering equipment for the U.S. semiconductor industry.
7. By the year 1990, Sony's annual revenues were greater than 20 billion dollars.

In comparison, Ampex's 1988 sales were \$701 million. The largest single line item of income on Ampex's financial statement was that of royalty payments from Sony and other Japanese licensees of Ampex video technology. A significant proportion of Ampex's video recorder sales were Sony broadcast VCR systems repackaged under the Ampex label. By the end of 1988, Ampex, purchased on the basis of a leveraged buy-out, had a debt-to-equity ratio greater than 17 to one. Its research and development expense was less than the interest paid on its debt.

Sony has not been the only Japanese firm to take advantage of the growth of the market for VCRs and related products. Other Japanese companies involved in producing audio and video recorders have experienced similar growth during the past 20 years. The growth of these companies and the tremendous amount of capital used to finance that growth is in large part the result of Japan's success in developing a whole series of interrelated end-use products and markets, commencing in part with the development of the videotape recorder and now aimed at integrating the markets for media, telecommunication services and electronics through high definition products and systems.

1.5 THE MIDDLE EAST

The strategy of leverage resulting from inter-related end-use markets affects everything. It has a huge bearing on the position of all countries, not just the United States and Japan. Let's examine for a moment the crisis in the Middle East. Oil as an end-use product, like information systems, is connected to everything. It provides raw materials for the chemical industry, it is fundamental to the cost of transportation and manufacturing. Increasing the price of oil affects interest rates around the world and the availability of credit. It's safe to say that the availability of oil directly affects every economy on this globe.

The United States and most other industrial countries have understood this for years. It is truly a strategic inter-related end-use market. Lack of access to oil as a product creates an immediate short- and long-term problem for any industrialized economy. Rapid increases in the price of oil will devastate the potential viability of a non-industrialized state that does not have reasonable access to the material. The apparent strategic nature of this product is so significant that the denial of that product to an industrialized country is significant enough to conjure up thoughts of war.

But oil is not the only strategic end-use market as I have pointed out earlier in my talk today. As time moves on and products and markets increasingly advance in their stage of development, many products and markets will in their own way become just as strategic as oil. Lack of access to these markets will quickly destroy the viability of products and technologies that support these markets and finally the industrial infrastructure of an entire economy. At the very least, the nation's control of its destiny will be negatively affected.

Loss of competitive strength in the manufacture of end-use products not only reduces the control that a nation has over its technological base but its economic base as well. In time, control will be lost over where products will be defined and manufactured and who will earn the profits. Lack of strategic positions in the manufacture of inter-related end-use products and the resulting negative effect on a nation's technological and economic base increases our dependence on other nations for critical products, components, technology and money necessary to field an army, support a navy or maintain an air force. It is

these circumstances that Mr. Ishihara was referring to in his recent work, The Japan that can Say 'No'.

The concept of opportunity cost as practiced in the United States usually concentrates on short-term goals. More often than not, the United States has found that walking away from products and markets in order to invest in more profitable areas has ultimately created a dependence on other nations for those very same products and related technologies that in time had become essential to remaining competitive in whatever markets were left. In the industrial world of today, when you find that you are dependent upon a major competitor for key technological and product support necessary for the viability of your base business, the long-term competitiveness of your enterprise is at the very least vulnerable.

1.6 CONCLUSION

In the world of the future — that of the information age — the Japanese feel that any nation that does not have a proprietary position in, or reliable strategic access to each of the market segments comprising electronics (including consumer electronics), the media (including software and mass media) and telecommunication services, will be at a significant competitive disadvantage to those that do. Therefore, the concept of withdrawing from the development of products and markets on the basis of opportunity cost is at best counterproductive.

Several top Japanese executives indicated that the end-use market infrastructure in electronics, as it exists today in Japan, is superior to that of the United States and moreover, that the interrelationships that bind this infrastructure together present a major obstacle to the possibility of competitive re-entry, let alone catch-up.

Japanese corporate management also feels that the infrastructure in electronic products now in place in their country, will become one with that of the media and telecommunication services linked together by the ability to process massive amounts of audio/visual information. And what concept is fundamental to the processing of this information?

Assuming that the combination of the markets for electronics, telecommunications and media is the basis for entry into the information age, the following conclusion should be considered. Any significant loss of infrastructure of proprietary end-use products and markets within the area of electronics, telecommunications and media may substantially reduce the growth potential of an economy dependent upon that infrastructure. The Japanese feel, and statistics tend to bear this out, that the infrastructure represented by the markets for electronics, telecommunications and media are of major significance to the economic and political development of the United States, Japan and Europe. Lose control of one and you may lose control of both.

Can the U.S. turn the tide in its favor? Absolutely. The U.S. computer industry is still dominant. America's position in mass media, software and transmission services is still solid. These markets can provide a basis for restoring America's competitive position. But such an effort must also include strategic moves back into consumer electronics, display systems, audio and video recording, computer peripherals, components, and related technologies. Otherwise, the combination of developments in high definition products and those markets America has lost will continue to encroach on remaining U.S. positions of strength.

But how does America turn the tide in its favor? The first thing that must happen is that there must be definitive leadership from the Executive Branch of the government of the United States. The problem as defined in my report affects everybody. Every individual in the United States has grown up with the concept that if you can't make enough money in a given product area in relationship to something else, you walk away from the unprofitable area in search of greener grass. Few people in the U.S. understand that all products and markets are inter-related, that all of us are tied together, and that the loss of any aspect of our infrastructure has an effect on the total economy. As such, we must begin to learn to assess the inter-related aspects of our resources on a national basis. The United States defines the short-term in milliseconds and the long term in periods of 5 to 10 years. In Japan, the long term means forever; and, as such, the equation has totally different parameters.

- A. The President must begin to create an atmosphere in his speeches and his actions that reinforce across the nation the concept that moving away from less profitable markets in search of higher returns and investments cannot be appropriately assessed unless long-term implications to the infrastructure of America are understood. He must begin to emphasize that because of linkage, loss of end-use market infrastructure can be a critical mistake even when the markets themselves may not seem critical. The President must help each and every one of us realize that the concept of opportunity-cost as delineated in this report is not healthy for America. We need only to look at what has happened to our savings and loan industries, the junk bond industry and the concept of leveraged buyouts to get some idea of what can happen when an individual's excitement at making a deal becomes more pervasive than the long-term importance of the effect of that deal on the infrastructure and the people of the United States.
- B. The Department of Commerce, in conjunction with OSTP, and the full backing of the President must help the United States focus on the fact that the competitiveness of individual companies is highly dependent upon the competitiveness of the country as a whole. Because products and markets pushed in development to their logical extreme become inter-related, linkage occurs between all segments of the economy. Based upon this linkage, what happens in one part of the economy affects all other parts. It is this premise of linkage that requires the United States of America to develop a national strategy designed to utilize the leverage of these markets to our benefit. It is exactly that leverage resulting from the linkage of products and markets now being developed within the Japanese economy that is causing so much difficulty in the competitiveness of U. S. industry. This trend must be reversed or the cost of re-entry will be overwhelming to the nation.
- C. The Department of Commerce must play a central role in establishing a national strategy--the strategy of leveraging linked products and markets.

The core of this national strategy must be based upon a detailed analysis of the current U. S. position in strategic inter-related end-use markets vis a vis that of other nations. This analysis should be developed by an office within the Department of Commerce comprised of experts capable of understanding the inter-related aspects of products and markets and prognosticating what might happen if current trends within the U.S. economy regarding those products and markets were to continue. Based upon this analysis, the "Office of Strategic Analysis" should engage all pertinent segments of the private industrial sector in a dialogue designed to determine the reasonableness of the report. One of the key purposes of this dialogue is to cause individual companies within the private sector to begin thinking about products and markets not necessarily immediately pertinent to their business but ultimately important to their long-term international competitiveness. Such an exercise will help the U.S. begin to develop a priority list of which products and markets are most strategic to the competitive health of the nation viewed over time.

The outcome of this effort should be a basis for a national strategy which combines the thinking of government and the private sector about ways to revitalize development and manufacturing efforts in support of key products and markets lost during past periods.

The cost of re-entry in many product and market areas will be very large--too large for the U. S. Government to use its funding of the effort as a principal means of re-entry. In many cases, joint ventures with firms in other countries already positioned in the markets in question will be desirable. The key is to ensure that these ventures including research and development and manufacturing occur on U. S. soil with a majority of equity owned by the U. S. company. To achieve this result, close cooperation between the respective U. S. firm and the government must exist so that a proper environment can be established to ensure a successful negotiation with the off-shore partner.

The principle point in all of this is the need for recognition that the Government of the United States in cooperation with the private sector must establish an environment which can most appropriately utilize the

competitive zeal, ingenuity and capital resources of the United States to re-enter into the manufacture of strategic inter-related end-use products previously lost to the philosophical malaise of opportunity cost.

Couple a modicum of fear with strategy, and the United States can again be the most competitive nation in the world. On the other hand, allow fear to reign without strategy, and American leadership is up for grabs.

Senator DIXON. Thank you, Mr. Elkus.

First of all, I'm going to place my statement in the record along with Chairman Riegle, and Senators Sanford and D'Amato.

OPENING STATEMENT OF CHAIRMAN RIEGLE

Chairman RIEGLE. There is no issue I consider more important to Americans than our Nation's competitiveness in today's global marketplace. The standard of living of our people, our political influence in the world, and ultimately our national security depends on how well our industries—both in manufacturing and in financial services—compete in an increasingly integrated world economy. That is why this committee has held 12 hearings during the 101st Congress to examine concerns that have been expressed by many responsible Americans about the declining competitive state of our country's industrial, technological, and financial base. They have confirmed what President Reagan's own Commission on Industrial Competitiveness reported to him in 1985, that is:

America's ability to compete in world markets is eroding. Growth in U.S. productivity lags far behind that of our foreign competitors.

Virtually all of our witnesses have agreed that in order to strengthen our manufacturing competitiveness we must reduce our cost of capital by increasing our savings rate and cutting our budget deficit. They agreed that we must lengthen the planning horizons of our corporations, improve our educational system, and remove various regulatory barriers to efficiency. But many witnesses including Robert Galvin of the Motorola Corp.; Norman Augustine of the Martin Marietta Corp., and Ian Ross of Bell Labs said that will not be enough. These men and many other witnesses said that the Japanese and many of our other competitors have devised national strategies to spur the development of strategic high-technology industries that will determine economic leadership in the 21st century.

This past spring, the Commerce Department released a report noting the United States was losing leadership in the electronic industry. It attributed this to the fact that other countries such as Japan had coordinated national policies to strengthen this industry, while we did not. In another report identifying 12 important emerging technologies, the Commerce Department warned that current trends would soon leave us lagging behind Japan in all 12. The report also called for industry, labor, academia, and government to work together to formulate new strategies for improved competitiveness.

We are very pleased to have an opportunity today to discuss these matters with three individuals who have run or are running companies on the front line of the competitive struggle. They are: Donald E. Petersen, chairman emeritus of the Ford Motor Co., Henry B. Schacht, chairman of the Cummins Engine Co., and Richard J. Elkus, chairman of Prometrix Corp., Dr. Charles H. Ferguson of MIT's Center for Technology Policy and Industrial Development was also scheduled to join us, but unfortunately he had to cancel his appearance at the last minute because of a family matter. We will include his full statement for the record nonetheless.

Gentlemen, we welcome you and appreciate your being here.

STATEMENT OF SENATOR DIXON

Senator DIXON. Mr. Chairman, I am pleased to be here this morning as the Senate Banking Committee continues its series of hearings on the competitive position of American industry in the world economy. Today's hearing focuses appropriately on what private sector and Government responses are needed to address the competitive economic challenges facing the United States.

I look forward to the testimony of Donald E. Petersen, chairman emeritus of the Ford Motor Co.; Henry B. Schacht, chairman and CEO of Cummins Engine Corp.; Richard J. Elkus, Jr., chairman of Prometrix Corp.; and Charles H. Ferguson, research associate at MIT's Center for Technology, Policy and Industrial Development.

I understand that since our last hearing on this subject the Commerce Department released a study on 12 emerging technologies, which warned that if current trends continue the United States will lag behind Japan in most emerging technologies and will trail the European Community in several.

Obviously, such conclusions are quite troubling. I hope that our witnesses today outline some concrete steps that this committee can take to improve America's international competitiveness.

OPENING STATEMENT OF SENATOR SANFORD

Senator SANFORD. Thank you Mr. Chairman and I would like to thank our astute panel of witnesses for their thought-provoking testimony. There is much to be learned from their experience in industrial America, and I receive their thoughts on developing a competitiveness strategy very respectfully.

I also would like to commend you, Mr. Chairman, for holding this hearing and the previous hearings we have held in this committee on the need to support our industrial and technological base. The fate of our Nation depends on how we address our Nation's budget crisis, and how we direct our attention to regaining our competitive edge.

The United States' once preeminent stature in the world marketplace has slipped considerably in this last decade. Our focus has been only on the very short term. As we have tried to regain wealth quickly, we have lost sight of the need to reinvest within our industries and our communities. As our budget deficit grew, our vision became very shortsighted and our economic policies reflected that vision.

In this next decade, we face the challenge of working within a smaller budget and establishing priorities for the Nation that will promote industrial growth and economic security. We must institute farsighted economic, budgetary, and trade measures, and we must promote macroeconomic policies that foster investment in education, physical capital, and infrastructures. This task will not be an easy one, and it will take the efforts of both industry and Government to set the Nation on the road to economic recovery.

I look forward to the input we will receive this morning from our distinguished panel of witnesses. We can only tackle these prob-

lems if everyone becomes aware of their magnitude and urgency and the need to honestly address the true size of our budget deficit.

OPENING STATEMENT OF SENATOR D'AMATO

Senator D'AMATO. Mr. Chairman, thank you for convening this hearing today on the subject of competitiveness. I am pleased to welcome today's witnesses, Mr. Donald E. Petersen, chairman emeritus of the Ford Motor Co.; Mr. Henry B. Schacht, chairman and chief executive officer of the Cummins Engine Corp.; Mr. Richard J. Elkus, Jr., chairman of the Prometrix Corp.; and Dr. Charles H. Ferguson, research associate at the Center for Technology, Policy, and Industrial Development at the Massachusetts Institute of Technology. I know my colleagues and I look forward to your testimony on this important subject.

Much has been written and said on the question of how to make the United States competitive once again in global markets. It frequently seems that the answers to this question are fundamental, yet difficult to achieve: A commitment to people and education, responsible fiscal policy, a regulatory environment that encourages investment, research, and development, and fair access to foreign markets.

We are all familiar with the drumbeat of bad news about America's difficulty competing in the global marketplace. Lagging investment in plants and equipment, lagging investment in nondefense research and development, lackluster results in education despite significant investment, and staggering trade deficit numbers despite record exports, are just some of the challenges we face in becoming competitive. I believe America is more than equal to that challenge, and each of us in our respective sectors has an important role to play in getting us there.

Today's hearing presents an opportunity for the kind of exchange that can prove useful in identifying solutions that work in regaining the competitive edge for the United States. Our witnesses today have impressive private sector and academic experience in dealing with these issues, and I am eager to evaluate their suggestions. I thank our distinguished panel of witnesses for taking the time to join us today.

Thank you, Mr. Chairman.

Senator DIXON. Have you made a statement?

Senator SHELBY. I have.

Senator DIXON. Thank you.

Well, Mr. Elkus, you've already talked about the need for a national strategy. But let me start by posing this question.

Last year, when Mr. Norman Augustine was here, then the chairman of the Martin-Marietta Corp., he appeared before our committee and he said the Japanese and some of our other industrial competitors have organized themselves to pick the market industries they want to lead in, and as a result, the market and industries we are not to lead in.

He said that we need a national strategy to deal with this type of competition. And I quote:

We are not talking about a centrally managed economy. The Russians tried it and it doesn't work. We're talking about a central strategy. The Japanese tried and it does work.

And so I'd like to ask all of you, first you, Mr. Petersen, how do you feel about Mr. Augustine's view?

Mr. PETERSEN. Certainly I would strongly endorse the thought that we, as a nation, have to have a better concept of what it is we want to focus our efforts on.

The danger would be if that led to a Federal Government-oriented decreed set of directives, if you will.

So I like the idea of getting much more concerned and expressing much more public concern of how rapidly we're losing our competitiveness, which is something that I think you've heard all of us address. I'd like to see the general actions taken to assist in investment in the future, such as assistance in R&D, lower cost of capital for longer term capital investments, creating a more friendly environment for the long pull that Mr. Elkus just described. By that, I mean a more steady and stable set of regulations and more predictable plan for the future that businesses then could rely on.

Within that atmosphere, I would hope the private sector would in fact operate on a longer term wheel base, and take a longer term point of view.

The problem that I worry about, whenever we talk about centralized industrial policy or whatever, would be if that led us to thinking that we can decree, from some central location, just what's going to happen and pick the winners. That type of action could be very stifling in areas that we don't anticipate will become of substantial importance in the future. And then we would find ourselves ignoring them.

I think if we had some basic principles, such as Mr. Elkus just described, in our minds, and stressed those, then we'd be on the right track.

One of his comments that strikes me especially is that development of products for customers follow markets. Second, wherever those products are made determines where the technology grows.

As a nation, we have been sending offshore or going out of too many kinds of businesses, too many kinds of technologies, that are fundamental to a whole broad range of consumer products. I think Mr. Elkus has identified that very well.

I think it would be very right if we identified the whole electronics industry as a threatened industry. It would be right if we defined that in a very broad way and did everything we could to bring the United States back into that ball game. Or we're going to watch the same thing happen in that very broadly defined industry that we've watched in so many others.

Senator DIXON. I may come back to that.

But let's hear from Mr. Schacht.

Mr. SCHACHT. Senator, I think the comments Mr. Augustine are quite correct, and I think they're dead on.

I would elaborate only in this respect. What we are missing today is the cohesiveness of policy, both public and private. There's no "they" in this. I mean, we're all in the same country, we're all thinking the same things, we're all trying to get the same thing done. But we simply have not elected, as a body, to think about the issues that need to be central if we're to be as competitive in the next several decades as we've been in the past several.

And in our policies, we have not found it important enough to align our policies with the issue of being competitive.

Now, what do I mean specifically by that? If you want to talk in a macro sense, we as a citizenry need to understand that if we are to enjoy the standard of living that we have enjoyed and would like our children to enjoy, then we have to invest and save, rather than consume, and we have to do it over a longer period rather than a shorter period.

And our policies simply do not encourage us to do that. To the extent that we, as citizens, can impress upon you, as our elected representatives, that we need to, regardless of the current pain, to readdress our priority on monetary and fiscal policy to start with. We have to have a set of policies, and the Senator before you came in, Senator Dixon, elaborated on some of them that I would subscribe to.

We've got to find a way to incite longer term and disincite shorter term investment.

We have to reward capital that is invested for the longer term rather than the shorter term.

We have to put more of a tax burden on ourselves, both as private citizens and as corporations. We are underfunding investment in both the private and the public infrastructure. We are underfunding education, and we are underfunding technology. And we are paying the price for it.

Now, I do not worry, for one, about the industrial competitiveness of U.S. corporations in the world scene. If, in fact, we are able to impress upon ourselves—and there's no "they" in this. You reflect and the bodies of this town reflect the opinion of this country. And we haven't yet awakened ourselves to the fact that we're slipping behind every single day. And as long as our deficit is in this kind of condition that it is, our Federal budget and our State budgets are rapidly approaching the same kind, we are underinvesting.

As long as our incentives are for short term gain and personal aggrandizement, rather than investment over the longer period of time, we are going to continue to slip, and our individual companies will adjust. We will adjust.

And the way we will adjust in our individual and macro responsibilities is to become more global, and to go to places where the investment climate is more friendly and more likely to produce a long term result than the current investment climate is here. And so you begin to hear global corporations instead of domestically-based corporations.

And that does not have to be. We have to compete in a global environment but we must, as a nation, readdress our sense of priorities.

And they've got to be simply: longer term investment with returns that are reasonable and not maximized; returns to all the elements of a corporation, as opposed to one element of a corporation.

We've got to readdress our tax incentives; we've got to reinvest our incentives for longer rather than shorter term investing.

We have to engage in a redirection of flow of funds to both education and technology. And our public and private infrastructure is woefully in need of attention.

None of this is new to any of you.

But, without that, the individual corporations do not have the capability to remain competitive, because the incentives all work against them.

Senator DIXON. Mr. Elkus.

Mr. ELKUS. In the 1970's, a concept was fostered which, I believe, has been adopted by the United States in large part, as a part of their national strategy. And that is a concept called, stars, cash cows, and dogs. The idea behind this concept is as follows:

A star is an area where you can make very high gross margins, looks like great growth, at least over the short term, excellent for capital gains, marvelous opportunity for an entrepreneur to make put an investment. And there's where you would like to invest your money.

Then there are cash cows. These are businesses which throw off lots of cash where there isn't a tremendous amount of growth, research and development really isn't all that big a requirement, cost of entry seems to be relatively high so there's some stability because other people aren't going to get in, you have such a great market position. You take cash out of those cash cows and you invest it in the stars.

Then you have the markets called dogs. These are more commodity items. Consumer electronics would be one of these. And you don't want to be in the dog markets because their gross margins are relatively low; the return on investment is relatively low. You want to get your money out of those businesses and into the stars.

Now, as a national strategy, I think that is suicide. If you understand that the long term is forever; not 10 or 20 years, and you know that in fact all products and markets get interrelated, then you understand very quickly that stars of today become dogs of tomorrow, become cash cows the next day become dogs again, become stars again, and in fact, there really isn't any delineation at any given point in time.

Let me bring this to a specific.

In Japan, there is a general concept—and I think of all corporations, Sony emulates this the best—that, as time goes on, due to the ability of processing lots and lots more information than we've been able to process in the past, and this is the foundation of high definition products and systems, that the media, telecommunications, and electronics are effectively going to become one as a market and that market will be called information systems. Most people that I talk to feel that this is going to show up somewhere around the year 2,000 in fact.

If this is true, then the general feeling is that that level of market called information systems will be a requirement for every other market and product in the world. It certainly is a requirement if you want to be able to take out Iraq's forces in a given period of time. You need certain types of information systems to do that quickly.

Somebody made a comment that I heard the other day that there's a big difference between computer chips and potato chips. Well, maybe not. You can't make potato chips economically unless you have computer chips.

The point I'm making is this. I think there is an absolute essential need for a national strategy. There's a big difference between policy and strategy. First, you have to decide what business you're in and where generally you'd like to go.

I think that national strategy, first and foremost, must recognize that walking away from products and markets on the basis of opportunity cost is a disaster. But to reverse this process is going to be very very difficult to achieve because the cost of reentry, now that we've lost so many markets, is going to be exceedingly high.

To that extent, I agree totally with the comments of Mr. Augustine.

Thank you.

Senator DIXON. Thank you, Mr. Elkus.

The distinguished Senator from Alabama, Senator Shelby.

Senator SHELBY. Thank you.

You're, I assume, talking about the differences between a central managed economy and a central strategy, two different things?

Mr. ELKUS. Absolutely. If you take a look at the strength of MITI in Japan, Ministry of International Trade, it is my opinion that the strength of that organization is not in any specific strategy it may have regarding any product or market, but the fact that it forces all segments of the economy to sit down and discuss what's going on in a general sense, so that no one part of the economy does something that finds its way into being totally detrimental to everybody else.

The problem in the United States is that somehow we think that every profit center stands on its own and has no relationship to any other. So, for example, something could happen in the chemical industry and wreck the banking industry. Something can happen in the banking industry and wreck the electronics industry. All parts of the economy, all parts, every individual is connected. This is a concept that is very difficult for us to understand.

Senator SHELBY. How do we get to this strategy? How are we going to bring together the forces in America to do it? We know it needs to be done. Are there laws, like the antitrust laws, keeping that from happening?

Mr. ELKUS. My feeling is that this question is kind of like the speed limit in California. When I drive on Highway 101 or down on the freeways in Los Angeles and the traffic permits, and I'm not going 70 to 80 miles an hour, I'm going to get killed. Now, the speed limit on many of those highways is 55 miles an hour.

The point I'm making is this. I don't think that you can legislate the concepts that I'm talking about here. If, in fact, an individual feels that he can act for himself, irrespective of what the effect is on anybody else, then there is nothing that you can do in terms of capital gains or anything else to alter the fact that he'll try to use whatever mechanism you've given him to his personal advantage at that moment.

That's why I feel that the President of the United States has an obligation to the country, by himself, through his Council of Economic Advisors, and the various parts of the executive branch, to begin to point out to the public in every possible way that just walking away from products and markets, simply on the basis of opportunity cost, is inappropriate.

Coupled with that, I think you need somebody—I call it the Office of Strategic Analysis—within the Government that works with industry to try to generate where we think the most strategic products and markets are, not because we want to walk away from anything, not because we want to pick winner and losers, but because we recognize that we have limited resources and need huge amounts of money that will have to be spent by industry as a whole, as we begin to concentrate on how can we creatively get back into what we've walked away from.

Senator SHELBY. Mr. Schacht, do you want to comment on that?

Mr. SCHACHT. I think that, if you're asking for specifics?

Senator SHELBY. Sure. We're going to have to get down to specifics.

Mr. SCHACHT. Got to do something; you can't just talk.

Senator SHELBY. That's right. We know the problem's there; now, we've got to do something about it.

Mr. SCHACHT. Right.

If I were to take a priority, I would say, we need to do the obvious. And we've got to convince ourselves that what is sitting right in front of us needs to be fixed. And if you want to pick one overriding concern, we are sopping up our savings in this country to fund others who are lending the money.

When we lent ourselves the money 20 and 30 years ago, at least the money got recirculated. To the extent that we run a Federal deficit of \$100 or \$200 billion, depending on how you'd like to count on any given day, we borrow that money from the international community, we have to pay that money back. And that is a stream of savings not available to this country to invest in its public and private entities. And until we fix that, we're going to drift.

Now, everybody knows the formula. The question is we, as the citizens, haven't convinced you, as our elected representatives, that we want you to fix it.

Senator SHELBY. Deficit and lack of a savings rate, right?

Mr. SCHACHT. Yes. And you can tick off all—I can give you macro issues but we're going to have to address our ability to fund what kinds of defense at what levels. We are going to have to tackle the unpleasant subject of entitlements, which mean all of us, mostly middle class and upper class entitlements. They're going to have to be taxed and we all know it. And we're going to have to address the issue of raising general taxes substantially.

The recirculation of the money that we're now lending or we're paying back to the lenders of overseas entities, will then be available to invest in this country.

I think at that time, we need to readdress the bias of short and long term, as I've said. What I would do is I would either lower the capital gains tax, as you have already said and I would support. But lowering the capital gains tax in the face of a lower revenue stream, in my view, is very difficult to think about, if you've already taken the position we have less tax revenues than we need.

So I would respond by saying that I would rather talk about changing the bias, of leaving the tax rate on capital gains where it is, and raising the tax rate on other kinds of investment.

For instance, I would urge you to consider thinking about taxing securities transactions on the amount of time they're held. Say you

can trade any time you want, but if you trade in the first 6 months, then you pay one kind of tax. If you hold for a year, you pay another tax. If you hold 5 years, you pay less; if you hold 10 years, you pay de minimis. That would bias people to think about the natural consequences of investing in industrial United States.

Our life cycle for product development is 7 years. We're being measured quarterly. And the tax system encourages people to do that. With your own investing, you would take advantage of it, also. The question is where do we then go for capital.

Cummins has spent 2 years looking for capital. It finally turned to its customer base. It couldn't raise capital on the money markets. Why? Because we haven't made any money in 4 or 5 years. Why haven't we made any money in 4 or 5 years? Because we just got through putting \$2 billion in long term investment. That is not welcome by any investor because, there is no bias to encourage that kind of behavior; all the bias is to go the other way.

Why are you doing that? Well, to be competitive. Well, don't you understand it's costing you short term money? Yes. You do it against all the incentives around you. If you readjust the incentives, we're off and sailing.

Senator SHELBY. How much more were you paying for capital, say, than a counterpart in Japan?

Mr. SCHACHT. Well, we don't exactly know but we're paying the going rate. There's a spread of at least 6 or 7 percentage points, which is enough to make the difference of go and no go, if you were short term economically driven.

Anyone in Cummins Engine Co. or anyone in Ford during Don's early times when Ford was investing while they were losing money, huge amounts of money in the cars that Don brought out that now dominate the United States car scene, produced such a success. The pressure on Ford Motor Co., on Don, and his predecessor, Phil Caldwell, was enormous not to do that because you could maximize short term pressure. There wouldn't be a Ford Motor Co. unless Don and Phil had worked against the incentives presented to them.

That's crazy.

When we talk to our Japanese counterparts, No. 1, their R&E credits are paid for by the Government; I don't think we ought to do it, but we ought to recognize the competitive advantages of doing it. They're paying probably 1.5 or 2 percent for their capital. We're paying 10 to 11. And that's tough sledding.

Senator SHELBY. Can't really compete for long like that.

Mr. SCHACHT. We can, but how long is the question. You can't do it unless you convince the shareholder body that you're going to invest for the product and not for the financial return.

Senator SHELBY. Mr. Petersen, do you have some comments?

Mr. PETERSEN. Yes, I do.

First, I endorse strongly Hank's comments concerning both the vital importance of addressing our major deficits, the Federal deficit and the trade deficit, as well as the need for actions to provide much more incentive for investment.

If, as a nation, we're actually going to start learning how to take a long term view, let me take the longest term point about com-

petitiveness as a society, and link it directly with what's going wrong in education in this country.

If we are seriously going to be competitive in the next century, we must make massive improvement in the education system in this country. We must very specifically find the actions and take them to assure that when we go to a majority of so-called minority employees, they are well-educated, they are up to speed, and they can deal with the more technical requirements that are clearly being imposed on the work force as our society develops these technologies.

Senator SHELBY. A digital world, huh?

Mr. PETERSEN. You bet.

So lack of education and its erosive effect on our competitiveness, I don't think, can be overemphasized.

Within that, I've already mentioned one major issue; the so-called minority that's going to be majority.

Second, we are woefully lacking, for some reason, the ability to generate interest among our young people, in the technical fields; science, mathematics, and all the related technology-driven fields. We simply aren't generating the technical people to permit this society to keep up.

The amount of money that U.S. industries spend on remedial education today is unconscionable. We're just not getting what the country's spending the money for in education. Among all of the measures that I've seen, as a society, we are spending more than enough money, on education but we're not getting the end result.

Senator SHELBY. The products are not coming out.

Mr. PETERSEN. We're not getting the end result.

So, of all the competitiveness actions, I guess that would be the longest term and perhaps, in my mind, the most fundamental.

I do think there are elements that are different between our approaches and let's say the Japanese, elements that work to our disadvantage. I've just finished a 41-year life in American industry. From day one, the environment, the atmosphere was that there was this restraint decree or some other decree, something that prevented us, or me, or anyone from daring to speak to a competitor about anything.

And so you grow up in an atmosphere in which the thought of cooperative work on future developments, technical developments, just doesn't come to you automatically. It's the direct opposite, i.e., you decide that, I think I'll play it safe and see to it I don't get involved with any competitor. That's kind of what evolves.

Whereas, in Japan, they're constantly working in a cooperative environment.

Another facet of this phenomenon within our society is that, for whatever reasons, it seems to me that we're unnecessarily adversarial in various bipolar areas. And one, of course, is between private industry and government. On the other hand, I think that the Japanese, again, for whatever reason, have found a way to work in a much more harmonious, more cooperative way.

Change will come if we all can find ways to develop that concept. One of my pet words, of course, is team work, where we actually get more cooperative effort going among companies within an industry. Recently, there are a few things that are starting to

emerge, a few; not many, but a few. In private industry, we have to prove that its precompetitive research or we dare not do it. But, nonetheless, we're at least starting a little bit in that line.

I think that we have to find ways where we can work together, Government and industry, on obviously common issues.

Senator SHELBY. How much time do we have?

Mr. PETERSEN. I agree with what's been said. The pace at which our industrial base is becoming progressively weaker and weaker is greater than our society realizes. And the relationships, the link that seems so remote to people is so direct.

Let me just give you another example. The loss of the consumer electronics industry is a severe weakening of the auto industry. Visualize, if you will, that in Japan, NEC, or whoever, one of the consumer electronics companies is constantly going to Toyota or Nissan or whoever, and saying, we anticipate that 5, 6, 7 years from now, we're going to be able to do this with compact discs or whatever it might be. And this will be one whale of a change from where we are today. You might be wanting to plan on it.

There's nobody left in America to come to Ford and say, 5 or 6 years from now, this technology's going to be becoming commercially feasible and we visualize it would certainly play into the environment of automobiles. We don't have anybody like that.

We've had to see what we could do to generate that capability within Ford. Well, that's kind of nutty. There's no way Ford's ever going to be world class in audio equipment, let's say, just to pick one. I think we're doing damn well, given the fact that we have to be in it on our own, now.

So this interrelationship among industries and the corrosive effect on our total strength, as we lose first one area, then another, is something that perhaps you could find a way to highlight that might be helpful.

One final comment. I just love the idea that you're having these hearings because if we can structure a circumstance where routinely and automatically the question is asked on whatever action, whether it's a regulatory action or a bill in Congress or whatever, "what effect will this have on the competitiveness of the United States in the world markets?" And we have to have an answer to that: it will make us less competitive, have no effect, or it will make us more competitive.

Senator SHELBY. And lower standard of living.

Mr. PETERSEN. Right. So if we just got into the habit of asking that question, regardless of whether it's a tax issue, an energy issue, some form of environmental issue, whatever it is, if we ask that question and include the answer to that question in our decision process, that would be a major step forward.

Senator SHELBY. Mr. Elkus, you wanted to comment again?

Mr. ELKUS. Yes. In my testimony, which I've submitted in writing, if you have a chance to take a look, there's an actual section on exactly what Mr. Petersen was saying.

When I was in Tokyo in the early part of 1989, Matsushita gave me a book that was published as a direct result of the 70th anniversary of their developmental laboratories. And in that book, it covered every kind of technology that they were working on, what the new products were going to be. They even gave the patent

numbers that you could go to to see what efforts they'd made up to that point in time to develop patents.

In any case, the purpose of that book was severalfold. One was to show all of the different things that they were doing, which is something that you don't find U.S. firms doing with their research and development laboratories. And you get a quick understanding of some of the things that were happening there.

For example, they obviously produce microwave ovens, they produce audio video recording equipment, they produce cameras of various sorts, that is, electronic cameras. They're in biotechnology and things like that.

But there was a section in that report on the automobile business. And that section found its way into a series of advertisements in U.S. magazines, including *Fortune* and *Business Week* and whatever. And I included a copy of that.

And it points out, in that ad, that in the car of the future, based upon the Matsushita working with Japanese automobile companies—Matsushita is in the consumer electronics field—working with Japanese automotive companies, that you'll have a heads up display on your windshield, that is, like a fighter plane where you look at the information on the windshield, as opposed to looking at the dash.

That you'll have a VCR that's set up for mobile communications tied with a satellite communications system so that you'll always know where you are and where you're going, and if there are road conditions that are problems for you.

That you'll have charge coupled devices, which is a semiconductor device made by Matsushita, which automatically sense road conditions before you get to them and adjust your electronics systems accordingly or provide warning that something may or may not go wrong.

That you'll be able to communicate directly with your microwave oven in your home, turning it on to the right temperature, or whatever, or your alarm system or your air conditioning system, temperature of the house, lock and unlock your doors.

Or you'll be able to take a mobile fax machine and communicate from your automobile to the office or to your home.

Or you'll have a complete hands-free phone system.

And, by the way, now, as you probably are aware, Nissan and Toyota are making their cars with the communications systems already wired in.

By the way, in the case of Lexis, you've got the Nakamishi sound system which is tied into the communications system, which you can use.

The point of all of this is, just as Mr. Petersen said, everything's getting locked together.

One of the greatest problems that the automobile industry faces is that, without a consumer electronics business, pretty soon they have to depend upon their most important competitors internationally for the very products that are required to keep them competitive with the guys they're competing with.

At some point in time, that can be a problem.

Senator SHELBY. Senator Dixon and I, in addition to serving on the Banking Committee, are members of the Armed Services Com-

mittee, and we see the interrelation to national security in this area. We've had hearings there, and coming from these vantage points, we're concerned from that area for the future, too. And I'm sure you are.

Mr. Elkus, you mentioned, earlier, the need for an Office of Strategic Analysis, or something of that effect, to identify the directions in which American industry needs to be going. In other words, where are we going? Where do we need to be going.

We had one administration official, some of us thought very bright, to do that; Craig Fields over at DARPA, and he was fired, you know, in that area.

How do we get your point across, which I think is valid, to our administration here in this?

I know the window of opportunity's short. I believe you're saying right here to this Banking Committee today.

Mr. ELKUS. First of all, I know Mr. Fields, Craig Fields. And I think he's a superb individual.

Senator SHELBY. Bright as he can be.

Mr. ELKUS. Second, I think the fact that he left our Government—I think he's now with MCC——

Senator SHELBY. Right.

Mr. ELKUS [continuing]. Probably is as good an indication of the problem that we face as any.

I had a debate at Stanford University with a gentleman by the name of Thomas Gayle Moore. I believe he retired from the Council of Economic Advisors in 1989, I think in May of 1989. When he did, he wrote a treatise on U.S. competitiveness. And in that treatise, he cited one individual, and the name was mine. I think it was the only name cited in the whole thing which, even though he disagreed with me, I guess it's a lefthanded compliment.

But be that as it may——

Senator SHELBY. He knew you were there, didn't he?

Mr. ELKUS. I guess.

But, in any case, I had written an article for the New York Times, and I talked about the fact that markets and products become interrelated. He took that statement and his comment at the end of the statement was, "utter nonsense."

Now, when an individual in that capacity looks at it that way—and I certainly feel that he believes what he says and you have to respect everybody's beliefs—when you have that kind of a fundamental problem, that is, that people really do not understand—and this is not an easy thing to understand, even though it sounds it, sitting in a room like this—then I think you are always plagued with the problem that if somebody, for example, a Craig Fields, is pushing too hard in a given area and it seems to be fundamentally opposed to the direction of the Nation which says, we don't want an industrial policy, let alone a strategy, that pretty soon it's like a rock and a hard place; somebody has to give, and it's not always the President.

There has to be a fundamental understanding that products and markets are interrelated on a physiological basis. This is not theory. This is not something we talk about in political debate. This is a fact that because products and markets become absolutely

interlinked that recognizing that begins to dictate a whole bunch of things.

The reason I talked about the Office of Strategic Analysis was not so much to give direction, *per se*, but to show the Nation in all kinds of ways, especially working with industry, that in fact the linkage is there. Once you recognize that linkage and are able to discuss it effectively with industry, then you can begin to work out strategies to alter the course.

Senator SHELBY. He was commenting, Mr. Chairman, on a question that I asked him.

We welcome you back, Mr. Chairman, to the committee, the chairman of the committee.

Senator DIXON. The chairman just returns from an important issue on the floor, and I am sure it takes a moment to reorganize his thoughts, but I was interested, Mr. Petersen, if I may, in various press articles that reported that you said that you were uncomfortable with the growing industrial might of Japan in the United States.

The same articles reported that you said you were uneasy about Japan because that country has yet to prove it does not practice adversarial trade in which the ultimate objective is to eliminate the competition.

I was the leader last year in a fight in the U.S. Senate concerning our gift of the FSX technology to the Japanese to develop the FSX, which I asserted ultimately would lead to their dominance in commercial aviation in space sometime in the next few years.

While that was ultimately resolved in a way that was somewhat satisfactory, I suppose, I would be interested in having you elaborate on your views about this.

Mr. PETERSEN. I picked up the word adversarial in conjunction with trade from Dr. Peter Drucker, so I want to give him credit for the thought. I use it now to differentiate what I believe has been the Japanese approach to competition and competitive trade versus what existed prior to that.

Basically we have gone through, you might say, two or perhaps three phases: The Adam Smith period when the world was lovely and we had something—I had something you wanted, you had something I wanted, and neither one of us made the other, so it was perfect.

We got out of the Adam Smith period and had a long stretch of intense competition, fortunately growing more and more to become worldwide competition, once we got over the ideas of isolation. In post-World War II we saw a boom driven heavily by much more open trade that was intensely competitive, but not driven to the ultimate objective of forcing out your competitor.

The objective has never been—historically you can see that—to drive other companies out of business. To put the foreign companies out of business. We compete like hell, but we do not go that far.

I endorse the fact and I give credit to Peter Drucker for initially outlining that the Japanese have demonstrated they take the whole idea of competition one step beyond anything that we have seen historically. That is, that to them the logical end result is the

elimination of competition. That is the point where he uses the word "adversarial," and that is what I had picked up.

So far we have seen a behavior coming out of Japan that all too often does seem to reflect this as their end goal. Now perhaps in earlier phases when Japan was recovering from World War II when it was developing and gradually growing in its importance, this was not so significant or so worrisome.

We now are talking about the second most powerful industrial company in the world. We are talking about a country that has worldwide responsibilities and obligations.

Just as the United States has naturally understood and operated within that concept for so many decades now, they, the Japanese simply cannot go around destroying elements of industries willy-nilly in this country, or that country, or some other country in a fashion that is irresponsible when they are of such importance to the whole world's network of industrial systems and trade systems. They simply cannot.

I think there needs to be a very strong voice that will express to the Japanese that it is up to them to straighten out their act, to clean up their act, if you will, and become a responsible No. 2, right now. And, I might add that I fear some day they might be No. 1 if we do not get our act together, and undertake more of the responsibilities and act in a more responsible way.

Until I see more evidence of change here, that is what I worry about. This is what I was trying to convey. I worry about them in almost anything they do, because I have seen that this end objective is so clearly in their minds by their behavior in so many fields.

Senator DIXON. I was interested in a comment by several of you where you indicated the value of this hearing, and I share that view. The Chair has been very, very significantly involved during his chairmanship in reaching out to develop this type of thought process with a lot of people.

I remember last year, Mr. Chairman, we had Mr. Galvin and others in here. I think it was probably in connection with my legislation, the DPA legislation—I am not sure—but we have had folks in here on the Export Administration Act, and they have shared the views that you very significant leaders in industrial America have given us today. But I do not sense that anybody—and I do not mean this critically in a partisan manner—that anybody in the administration, and I would say that whether it was a Democratic or a Republican administration—ever reaches out and says, well, why do we not get some of the business leaders in America together and find out what kind of a strategy we really ought to have.

I do not think that that ever happens. Now maybe there are some private meetings someplace that I am not privy to or never hear about where we have exceptional men and exceptional leaders like the three of you coming in here—I hesitate to say how often, Mr. Chairman—but I remember on a variety of different occasions, people that I have ultimate respect for who always say, we do not want an industrial policy or anything like that.

Business cannot do anything until government sits down and tells us how much we can do, but almost everybody is saying that there ought to be some kind of a strategy. I never get the sense that there is one.

We talk like this, and it is a good thing, but what does it take to get this kind of a dialog going in a more significant way?

As an example, almost every time we get into these questions like the FSX or any kind of policies that we have that are obviously matters that have a commercial value in this country, the sense is with most of us that Commerce is not very much involved. It might be Defense involved, or it might be some other agency of Government, but most of the time we do not see that Commerce is involved very much.

Mr. PETERSEN. I might mention the dilemma that you have just expressed so well—

Senator DIXON. Whether you agree with my views or not, because maybe you do not, on FSX.

Mr. PETERSEN [continuing]. On how do we come together and really address the issue that lies behind the formation of the Council on Competitiveness. It is an attempt to bring together individuals such as the three of us from business, individuals from academia, and from organized labor to see if as a group we can find areas of common agreement and find ways that we can be a voice and start building some bridges and start creating some environments in which we can come together to address the problem.

So we are hoping that the Council on Competitiveness can be one step along this path.

Senator DIXON. I would hope so. If I could pursue this a moment further, Mr. Chairman, because I so much value the things that you have done in entertaining these dialogs. They are relatively new over the last couple of years, and I think they are valuable to all of us.

I might just say, as an example, that the Illinois congressional delegation—I have the honor of being a member of that delegation—meets on a regular basis once or twice, and sometimes more often, a month. We have created what we call the Institute for Illinois.

That Institute for Illinois is a separate organization, but on its board are some members of our congressional group. It is supported by money from business interests in our State, not by taxpayers' money at all. We meet on a regular basis, a quarterly basis, but we also have the president of that group who is a salaried individual paid for by the funds that are accumulated. We try to determine policies that are able to advance the interests of our State in our dialog with business interests and so forth.

We think that helps us a little bit. At least it is our early view that it does, after several years of that experience.

Do we try to do anything nationally along those lines to try to share these views between the Government and business leaders to try to get business leaders' ideas about what are sound policies for us in connection with international competition and things of that kind?

Mr. PETERSEN. Nothing that I can think of. The Business Council is one forum where Government, individuals, and business leaders meet a couple of times a year, but it is very specifically designed not to be a lobbying agency.

It does not meet often enough to have a dynamic effect that would, in my opinion, cause action.

Senator DIXON. I do not want to be a smart guy, but if we have a national strategy, I do not know what it is. I do not mean that critically. I have been around here 10 years, not as long as many others, but if we have a national strategy I am not sure of it.

Mr. PETERSEN. We do not, in my opinion.

Senator DIXON. Thank you for sharing that view. I thought maybe I missed one around here.

Mr. PETERSEN. We do not. We do not, in my opinion.

Senator DIXON. I thank the Chair.

The CHAIRMAN. Senator Shelby.

Senator SHELBY. Mr. Chairman, I just note that out in the audience here we have got another distinguished observer, Mr. Prestowich. A lot of us know him. He has put a book together. He has written a lot of articles on trading places. I want to recognize him because he has been involved in the trade wars at the right place at the right time. He has written a very good book on this. He is outspoken on it on what is happening, just like you have been doing here this morning. He has done it, and probably paid for it at times, but I did want to take a second to acknowledge him being here.

He is here as an observer because he knows what you have to say is important, and important to the future.

I would like to get back to one central thing that bothered me, and I know that it has bothered the chairman and Senator Dixon.

As we lose our competitiveness in the world and our industrial base becomes second-rate, and are totally dependent on Japan because of the digital world we have entered into, and in the comments you made about where the Japanese in microelectronics are going as far as the automobile industry is concerned, and probably in your industry and yours, that has got to have a tremendous impact on national security.

Right, today, here it is 1990 and we seem to be doing all right in the world. We have done well. We have had a big buildup. But if we do not have the right mix there for our industrial base, we will go down.

If we go down industrially in the world, ultimately we are going to go down as a military power. Is that not a given, basically?

Mr. PETERSEN. I would agree with that.

Mr. SCHACHT. Sure.

Mr. ELKUS. Absolutely. If you look at the——

Senator SHELBY. It is all interrelated.

Mr. ELKUS. If you look at the book "The Japan That Can't Say No" written by Mr. Ishihara and Mr. Morita, on page 3 of the document that I was given, you can see a specific reference by Mr. Ishihara to that point that at this stage in the game Japan has a certain capability with respect to semiconductors and related electronics. And it literally, if it wanted to, in his estimation, could in some way influence the balance of power between Russia and the United States.

Now certainly that conclusion is ameliorated because of the events that have occurred, but the fact of the matter is that this is absolutely the case.

When we were in Japan as part of the National Science Foundation studies, one of the members who was then head of the Society

For Information Displays, noted that in his estimation the electronic packaging capability and display technology that was existing in consumer electronic products on the shelves in Japanese stores exceeded anything that he knew about in the Department of Defense.

Senator SHELBY. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Shelby, for your kindness in chairing the hearing. As things happen, you plan something that you very much want to do, and then other events come crashing in.

We had today on the Senate floor, as others have probably indicated, a very important debate and vote on a cloture motion on CAFE standards. This is an area where the Federal Government of course is considering whether additional fuel economy standards ought to be mandated into law, and everything that would flow from that.

Then, right after the vote was taken, time had to be spent with the majority leader to work out strategy and procedures for what now follows that particular vote.

In any case, without spending more time on that, I want to by way of apology indicate to you that that was why I was not here with you.

Mr. PETERSEN. I confess to curiosity as to the outcome.

The CHAIRMAN. I thought you might have some curiosity. I have to preface it by saying that vote counts move around, and they do not always mean what they appear to mean. Those that wanted to vote cloture on the motion to proceed, which is just to take up the issue, needed 60 votes. They got 68 votes today, so they had 8 more than they needed.

On the other hand, some of those votes were from people who who could have gone either way, it is fair to say: on a second cloture vote which will come at a later time on the actual bill, they will vote the other way. So I think you will find that for this vote, you have to measure this vote against this moment in this legislative parliamentary situation, and you have to take a different assessment as to what comes next.

I think we will win this fight, but sometimes you are not quite sure in a 9-inning game that you will win the game. You do not always win it in the first inning, but sometimes you do things in the first inning that let you win in the fourth inning, as you all well know. That is where we are on that.

I want to say to you that I think this topic is the most important topic facing our country. I say that because our economic strength and our economic wherewithal are what pay for everything else, whether for health care, good education, or decent housing, or a good standard of living for our people, or safe streets, or anything that you want to think about.

Our ability to produce depends on having an economic system in place that works, and works competitively, particularly in this new global economy, in a way that can preserve our living standard and hopefully add to it over time.

My own view is that lifting our productivity rate from something like 2 percent a year to 4 percent a year ought to be our primary goal. If we can organize our thinking and organize our effort to accomplish that in stages and in steps, but as quickly as we can, then we can get up to a level of performance and excellence in our work

that can give us the economic output and wherewithal to do lots of constructive things—not just public sector things, but a much larger number of private sector things and private family things we all do.

This is the engine of our future that we are talking about, our ability to have a good future. In looking at the materials you have brought today, I am very concerned myself as to where we seem to be in terms of these eroding competitive positions in our trend lines.

I might just say for the record that it was mentioned that we have embarked on a series of hearings to lay a foundation of knowledge and expert opinion that can enable us at some point to do something to put this national strategy together and to at least be able to articulate it and get it out there to get some kind of a serious, focused debate going.

We have had seated where you are to today, last year, Frank Carlucci, Bobby Inman and Robert Costello looking at the technologically competitive side of things. Then in terms of financial services we have had Mr. Corrigan, Felix Rohatyn, John Reed of Citicorp, Jay Light of the Harvard Business School; and out of the industrial sector we had Norman Augustine, Robert Galvin—which was mentioned, and Stan Pace from General Dynamics. We have had other leading academic figures, and Bennie Freeman Bernstein, an author of some note; and Larry Chimerine, a senior economic adviser and economist who is well known. We also brought in some world-class, if you will, economists who were Nobel Prize winners. We had that on a day when the weather was lousy, so some did not get here.

We had Paul Samuelson and Larry Klein in.

So your testimony, you should know, is a part of that body of information that we are attempting to assemble systematically and thoroughly so we will know what we are talking about and so that we have solid expert footing underneath the observations and the recommendations that we make.

Having said all that, it seems to me that we are letting the future slip out of our hands. As I have heard what you have had to say since I have come into the room, I see other nations surging ahead by all measures, whether it is education performance levels, or productivity improvement levels, or capital investment levels, or rate of R&D advance, or what have you.

It is really a stunning set of developments. If you look at our debtor-Nation status, we are on our way to a trillion dollar international debt. We borrow money and have to pay more for it, especially with these latest problems in the Middle East, our dependence on energy, the higher costs of energy and what have you.

We are in a very greatly stressed economic and financial position. We have had the top experts in Government come in here within the last several days to tell us that the Bank Insurance Fund, for example, is under very great stress at the present time. This of course comes after the savings and loan problem. They are different, but it is another kind of warning signal of problems not attended to, of financial circumstances and trend lines not strong and working for us the way they should.

I want to just give you a couple of other observations, and then I will pose some questions to you.

I want to say to you, Mr. Petersen, that your leadership at Ford Motor Co. particularly is something that I had the chance to see at close range. I so admire the job that you and your team there did in terms of giving direction and enabling a performance by that company that is really a standard-setting performance.

So your views on what it takes and how you get it done in the midst of the kind of tough competition that exists in the world today is especially valuable. Cummins Engine, too, I think—which I am also quite familiar with—has shown us that.

But your leadership, particularly, is something that I have seen at the closest range. So I think your views particularly are as good as anybody's on this subject. I cannot think of anybody I think I would rate higher.

I would like to know what you think we are headed to, and what we can look for if we do not get some of these basic things changed.

If we do not undertake some kind of a more effective strategy to reverse some of these trend-line erosions in terms of our comparisons with international players, where are we heading?

I mean, what is up the road 5 years, 10 years? What do you foresee if we continue on the track we are on?

Mr. PETERSEN. I think the simplest way I would express what we are headed for, is to say that instead of a continuously rising standard of living, which we have had as a nation throughout our history, we are headed for a declining standard of living. It is just that simple.

The CHAIRMAN. If we have a decline in our standard of living—which is a very hard thing for society to have to accept and come to terms with—it would seem to me that you get all sorts of consequences and fallouts from that.

I mean, if you have got a declining standard of living, you are going to have some people that manage to continue to do well, and others who are going to do much less well, and then does that not start to pull your society apart?

Mr. PETERSEN. One of the dynamics in large entities that has been striking to me is the importance of momentum. When things were going well, when we were a society with dynamic growth, opportunity was obvious, new enterprises were being formed at a great rate and, the momentum was all positive.

In my own case at Ford, I have on a number of occasions seen that momentum go both ways. It is a very interesting phenomenon to observe. What is worrying me now is that we have been in a dynamic of declining momentum, downward momentum that is going to be extremely hard to turn around.

It is an insidious thing. It is not dramatic at any one point. It is not dramatic from week to week or month to month, or even year to year. You can even say that in certain sectors we have seen very real improvement over the last decade.

Yet, I would say that I view the industrial strength of the United States as being definitely weaker today than it was 10 years ago. That is despite the fact that I think in my own case I can say with honesty that the Ford Motor Co. is a stronger, more dynamic com-

pany today than it was 10 years ago. That decline, that pervasive decline, is just an insidious one.

If I could link another problem, and Mr. Elkus made reference to this earlier when you weren't here, Mr. Chairman, that is that we still have coming out of absolutely outstanding higher education field, an extraordinary continuing development of brilliant new ideas with startups of a very broad nature.

The job generation of the past years has all been in the area of very small production companies, or manufacturing companies. The large companies have not been the generator of new jobs. It has been the small ones.

The problem is, we still have that clear advantage in the world. We have these leading edge thinkers who come up with these brilliant breakthroughs and brilliant ideas, and they get started and do extraordinarily well—the Tray Gates of this world in Micro-Soft—for a period of time.

The CHAIRMAN. Henry Ford the first.

Mr. PETERSEN. Yes.

The CHAIRMAN. What a wonderful example.

Mr. PETERSEN. Now what is going wrong is that that advantage is not being consolidated in the United States. These ideas are being picked up by others, and we have of course been watching the Japanese become far superior to us in taking and commercializing ideas and investing with a very long-term view. They have lots of things that help them do this.

We have talked about patient capital here this morning. And they are running away with the ultimate, multi-billion dollar market potential, piece of so many of these ideas. That is where we are really losing as far as a continued dynamism, a continued rebirth and regrowth of our larger industrial base.

The CHAIRMAN. Our society has this history and these patterns of how decisions are made and how various parts of our society work together and separately, Government, business, labor, et cetera. When you look at it today in terms of the urgency of getting us off these trend lines into stronger, higher performance trend lines, what are the two or three things— and I want to pose this to each of you, but I will start with you, Mr. Petersen—what are the two or three things that government for its part can at this time constructively do?

I am thinking in terms of National Government. What are the things that would be most helpful that we could undertake to try to do here that would make more of a surge in terms of our overall economic performance?

Mr. PETERSEN. I will steal Henry's No. 1, because it is my No. 1: The Federal deficit.

The single biggest benefit for making our society truly competitive would be a forthright, aggressive effort at dealing with our Federal deficit. Let me just tack on the trade deficit with that—the twin deficits, as we used to call them.

Then I would say—let me jump—

The CHAIRMAN [continuing]. May I ask you one question on that—

Mr. PETERSEN. Yes.

The CHAIRMAN [continuing]. Before you go ahead. I will not go off on any great length on this. We have got a whole room full of budget summitters in an airplane hangar out at Andrews Air Force Base trying to crack that nut at the present time.

Is getting the deficit down so important, in and of itself? The other side of that is you may have some irreducible minimum of Government activity that has got to be carried out and has got to be paid for—if you want to pay for it and not have a deficit, then you have got to raise the money.

I am not asking you to be for higher taxes, but in order to get the deficit down that is probably part of it. I am interested in knowing from a business perspective whether serious business leaders feel that paying the bills, even if it means raising taxes, may very well have to be part of this in order to get it down so you can get these other benefits?

Mr. PETERSEN. I have reached the personal conclusion that we have a problem that is so enormous, I do not see a solution except with increased taxes as part of our actions. As much as I believe there is just extraordinary opportunity for greater efficiency in our Government, and therefore for reduction in costs, in this environment and in this set of circumstances it seems to me taxes have to be part of it.

I might as well go on and say that when you need revenue, and when you are concerned about energy, and you are concerned about matters in the Middle East, it seems to me this is a mighty good time to finally address the energy policy of this country—or to get one.

Get an energy policy. Then decide, now how are we going to have customer incentives so that the customer behavior will be consistent with the policy we want to follow? Then, what action should we take?

I suspect one of them is: Let's have some more taxes on gasoline as part of a revenue-enhancing overall package.

The CHAIRMAN. I appreciate that, and I appreciate your directness. I do not mean to get off into that debate because that is a huge debate and it could go on for a long period of time.

But with respect to your first goal, then, you say get the deficits down. That is No. 1.

Mr. PETERSEN. Right.

The CHAIRMAN. What would be No. 2 or 3?

Mr. PETERSEN. This one perhaps might not be on a lot of people's top three, but it is so fundamental to the long-term competitiveness it has to be on my list and is part of what I testified on, and that is the extraordinary importance of the human element in this whole effort. And behind that, education is of paramount importance.

The evidence is so dramatic that we are falling badly behind in that area, we simply cannot permit this to continue. So another one in my top three would have to be a massive improvement in education.

Then finally, incentives to encourage all of the individual decisions throughout our society to emphasize the long-term. In other words, incentives for long-term investment, incentives for spending in R&D, anything and everything that would help in that field.

Let me just wrap around that finding all of the ways to work together in a more cooperative fashion rather than as adversaries.

The CHAIRMAN. You know, it is interesting. I use this phrase "Team America," and the feeling that we have really got to unify and consolidate, work as a team and reinforce each other, and get that higher level of performance in large part out of a real team effort.

With respect to your point about long-term versus short-term—and I agree with that as well—we have become so short-term oriented in everything: everything is literally right now, period, today, this minute. Tipping the balance, at the same time that you do not tip the economy over, between consumption versus savings and investment in a longer-term horizon is really requiring sort of cutting against some impulses and some instincts that we have now to such a strong degree.

You I am sure have had this happen, too. Every time I get my monthly bank statement, there is an invitation in there, very attractively advertised, to yank some part of my home equity out of my house and spend it on whatever—you know, a trip, or a sailing boat, or whatever one wants. The push to spend for consumption and to do something now is such a huge part of the whole way in which the society is structured these days that it is awfully hard to sort of put up a stop light and say, all right, now we really want to try to start to put a different set of signals in place, and we want to kind of calm down in that rush and start thinking about saving, and investing, and longer term orientations and so forth.

It is just very difficult. It is like swimming up Niagara Falls in terms of the signals, and the pressures, and the inducements that people are getting every single day to the contrary.

But let me hear your respective lists.

Mr. SCHACHT. Senator, I would not differ at all with Don. I will try different words on the same thing.

First you need to think about where we are. I think, in response to an earlier question you and your colleagues were asking, I think the day is very late. I do not think we have a lot of time, because these things do not turn easily or quickly and the results are measured in decades.

We have been systematically underinvesting as a national policy, whether explicit or implicit, in our physical infrastructure both public and private, and in our human infrastructure.

If you stop and think that private businesses essentially gather together human capital and physical capital, and we have built this country on the assumption that those who come together voluntarily to produce goods and services that could not be produced individually get collective good from this, then you have got to have collective reward for the elements that come together: the human and the physical capital.

If we drive our incentives toward short-term, we will get short-term results. As we do, we will consume instead of invest. So the issue is as Don described it. We need a different mindset. You described it earlier as a different set of signals.

I am perplexed. You and your colleagues, both elected in the legislative bodies and the administration, represent collectively what this country says about itself. You can lead, to an extent, but we

have to send you signals that we are willing to be led, or else the process is not working well.

We have not as a body of citizenry been willing to say to you, as the collective legislative and administrative group, we understand that both new signals are needed and new approaches are required.

Whether we can do it as an individual group of several hundred million, or whether this will have to come from either the legislative or executive branches, I am in a bit of a puzzle, but it has to come from somewhere. We need new signals.

Back when we were a nation that was essentially domestic, it was not all that critical because the redeployment of assets occurred within the same geopolitical structure. If our textile industry failed in the Northeast and moved to the South, we recycled tax moneys and we took care of those who were harmed in the Northeast.

The CHAIRMAN. Right.

Mr. SCHACHT. If the South fell on hard agricultural times and California and the Southwest boomed, our own geopolitical system recycled the benefits to all of our citizenry and we maintained a standard of living that grew over time.

We have a set of biases and a set of rules based on a set of assumptions that we are a dominant domestic economy, and we are not. We are one of a multipolar international community and our incentives are set and administered both publicly and privately as if we were still a domestic economy.

We believe monetary policy in this increasingly likely recession will finally come to our rescue. It cannot.

The CHAIRMAN. I agree with you.

Mr. SCHACHT. We have to buy money to fund our deficit.

The CHAIRMAN. Yes.

Mr. SCHACHT. Monetary policy will not come to our rescue in this finally arriving recession. We have mortgaged the time.

We think fiscal policy will somehow work. Raise taxes in the face of a \$200 billion deficit?

The CHAIRMAN. I wish it were \$200 billion.

Mr. SCHACHT. Well, if you count it right—

The CHAIRMAN. It is above \$300 billion, and close to \$400 billion.

Mr. SCHACHT. I would guess \$370 billion is my number, if you do the math right—

The CHAIRMAN. That is right.

Mr. SCHACHT [continuing]. And is going to dramatically increase, in my view, this year.

I think we are in a recession. I think it is going to be deep. I do not think we know exactly what our policy issues will be, having already expended both fiscal and monetary policy. And this comes out of a sense that the U.S. body politick is not yet aware.

The problem with this crisis—and it is a crisis, in my view—is there is no crisis. It is drip, drip, drip. The crisis of underinvesting over a very long time, and underconsuming—excuse me, overconsuming on a very long period of time, has got to be arrested.

We as individual companies will get swamped by the macro-events, and the issues are starkly simple. Don has already enumerated them. I will simply repeat:

We have got to redress our fiscal sense of ourselves to live within our means. We cannot continually borrow from others. When we then have to pay them back, that investment stream is not available to this country. We are an international community. We are international companies, but we are still essentially dependent on the domestic market.

Unless we address our deficit—and my plea to you and your colleagues and to those who are closeted in the airplane hangar is: Lift thy sights.

The CHAIRMAN. Yes.

Mr. SCHACHT. We must not produce a mouse. We have got to do something that readdresses the investment and consumption bias. We must raise our taxes. Of course we have to raise taxes. We have all known it individually for at least 6 years. We cannot politically admit it, for whatever our individual bias is.

We have to raise taxes. We are underfunding our public and private infrastructure in whatever manner you care to allocate the funds. We are paying our debt to those who do not recirculate the money to this country.

We have got to fix our deficit.

We have got to restore sanity to our fiscal policy.

We have got to get recontrol of our monetary policy.

And I would add, a coequal first priority is to redress the biases of the tax code, of the way we collect and the way we invest the long-term rather than the short-term, and to recognize that we are an international, interdependent community acting as if we are not. And time's up.

The CHAIRMAN. I want to just make a comment about what you have said. I think that is a powerful and accurate summary.

It is interesting. If you look at the long history, if there was ever a nation that God endowed with——

Mr. SCHACHT. Absolutely.

The CHAIRMAN [continuing]. A wonderful set of advantages, it was this one, not only in terms of this huge continental land mass with all of its resources, which we have been using now over 200-plus years, but then we have got this wonderful mixture of international population that came.

We became a melting pot nation. We had good values. We had a good political system, and things were really going our way, and we have made the most of it.

Then after World War II and the other countries of the world were hammered down as much as they were, particularly our major competitors, we got really almost a 50-year run where we had most of the chips in the game and the others had very little.

I was in an antique shop the other day and I was looking at some of these little fake Hummel figurines that say "Made in Occupied Japan" on the bottom when they were trying to get back into the game right after World War II. When I think about what they have accomplished in going from that exercise to the kind of economic and financial competitive powerhouse they are today, it really takes your breath away.

If you add all the rest of it, we have had this post-cold war period, and I do not think we have recognized, in even a first level of serious analysis, how our relative position has changed, and how

we have squandered a lot of time and a lot of opportunity and have been really quite wasteful in a lot of ways, while the rest of the world has worked very hard.

Maybe that is what happens when you lose the war. You work harder as a result. Those countries have really come steaming along and are in very strong shape at the present time.

Now we are at a point that it really tests all of our myths and all of our impulses, reflexes, and historic notions, because we are in a different kind of a situation. We do not have much historical experience that is close enough to be relevant to draw upon. So it is a new problem.

It is so big, and it is so complicated, that most people find it very hard to see—and it is so uncomfortable. I mean, when you start getting into it, the people tend to back away. It is more interesting to wonder whether Cecil Fielder is going to get No. 47 tonight, or tomorrow in the baseball game, rather than to try to unravel this extraordinarily complex economic puzzle and challenge that is facing the United States.

Let me tell you a concern that I have that was part of my question to you, now, as we come to our final witness here. That is, this:

I think that you start to get when a country does not make the economic adjustments properly, terrific fallout from that with social stresses and problems of a dimension that are almost unfathomable.

I mean, when you get a high school dropout rate of 26 percent in the country it is enough to make everybody hang their head in shame. But if you take the urban crime rate, or you take the number of other measures of human distress, homicides in our cities or whatever it happens to be, you start to see aspects of what I call a sort of a "Clockwork Orange" society beginning to emerge. And that is not to overdraw it.

There are too many examples, whether it is this young fellow from Utah trying to defend his mother in the New York subway, or a General Motors executive that was driving down a city street in Detroit the other day and some kids who wanted a car to go to a party, blocked the roadway and shot him, and he died on the way to the hospital.

There are any number of illustrations of what is going on with respect to a kind of stress that comes off this economic underperformance and that works its way into the lives of people and into our social fabric.

I even see a manifestation of that politically now in terms of what just happened in the Province of Ontario in Canada, which a lot of people have not tuned in on yet, where there was a big election upset in which the equivalent of the Republican and Democratic Parties were turned aside, and a very promising young head of the one party that was in power, David Peterson, was tossed out. The Socialist Party was elected by quite a large margin, and basically on economic issues because of the stresses and strains that are working their way down.

And of course for those of us who are from Michigan or the upper Midwest, Windsor is not very far away. You do not swim across the Detroit River to get there, but you can certainly walk across the bridge.

So I think you are beginning to see a geopolitical element as well as a social set of repercussions that are coming out of this among the manifestations of underperformance in this gathering storm.

There are a lot of things at work here that are very troubling. Let me just say a couple more things about it.

Why is not something being done about it? Why is not the Government doing more about it, itself, because we ought to have the broad strategic view in terms of the country as a whole?

We are not set up to do it that way. Even here in the Congress we are divided among various committees, and the committee slices do not line up with respect to being able to collect the whole picture at one time.

I serve on the Finance Committee, and that is one slice of the puzzle that goes to tax incentives and capital formation and how the financial markets work.

I serve here on the Banking Committee.

I also serve on the Budget Committee, and for 10 years served on the Commerce Committee in the Senate. So I have been able to be on all four major economic committees, but by so doing I see how we are piecemealed out.

In effect we need a committee that collects what at least those four collect in some kind of a focused work effort. We do not have that. So we have now formed a task force here in the Senate, at least on the Democratic side, of chairmen from the major committees to try to deal with this question of what do we do in sort of the post-cold war economy with the Berlin Wall opening up.

This was set up just prior to this adventure in Saudi Arabia, but it looks like we are going to have a peace dividend to work with. So the question is: How do you use it to invest in the things that could get America making a domestic economic surge in these very things you talk about?

So a group was set up. Senator Nunn is on that group, Senator Bentsen; I was asked to chair that group. We have just gotten started on it, and lo and behold we are air lifting 100,000 troops into Saudi Arabia.

We are quite alone out there, as you know. Our traditional allies are helping a little bit on the margins, but they do not really want to put their young men and women on one sand dune or another sand dune. They would just as soon have us out taking care of all of the sand dunes. So we are essentially taking care of all the sand dunes today, and we have got the picture of the Secretary of State and the Secretary of the Treasury out with a tin cup going around the world to see if we can get a few contributions to sort of pick up some of the financial tab. It is very disquieting.

But leaving that to the side, we are trying to put together a work process, just a work process, by which we can collect these issues in a form in which we can try to put them in an intelligent, understandable way to the American people and start looking at what our choices are and what our requirements are for the changes that have to be made.

I must say, I am at a bit of a loss as to why it is that the business community and so many really thoughtful and articulate leaders like yourselves are not able as well to get through to an administration—forget which party it is. It happens to be the George Bush

administration now; it was a Ronald Reagan administration; it was a Jimmy Carter administration—why is it that in the executive branch of Government, which is really much more the strategic, direction-setting branch of government in terms of the resources and the leverage that it has, why is it that we do not seem to generate any sense of urgency there, or even get a discussion going?

I mean, it seems very obvious to me that if George Bush would collect 20 people like yourself around the table in the Cabinet room and spend a month talking about these things, that out of that would come some sense of the kind of revised strategic direction that could start to let us do the things and focus on the things that could lift our economic trend line performance.

I do not see that happening. I do not see anybody tearing the front door off the White House to get in to force the meeting, and obviously I do not see him calling the meeting—which is really the way it ought to work.

But why is that? Why is the business community, having this global perspective and understanding and probably having the best feel for it now of anybody in our society—maybe some academic people who are spending a lot of time on it, too—why is there not such a compelling sense of urgency that our business leadership should be just banging on the front door of the White House to get the President's attention, whoever the President happens to be, or banging on the doors of the Congress, or banging on the political system, or doing something that really energizes everybody to come out of this deep sleep in terms of the policy-setters, and to start to get going on something? Why is that not happening?

Yes.

Mr. ELKUS. I would like to answer that, but first to add just a little bit to what you were asking of the other two gentlemen on the panel.

I would like to define the problem, first. First of all, I agree with everything that has been said by the other panel members, but I would like to define the problem in slightly different terms.

I think that what is very rapidly happening here is that the United States is losing control of its political and economic destiny.

Now under those circumstances, any ability to predict what will happen in the future really is ceded to somebody else, and therefore it becomes unpredictable. All you know is that because we were such a large part of the world that a change of that magnitude is going to be very unsettling to the world at large.

So what I think we are talking about here certainly is a loss of standard of living. My guess is we are going to lose that standard of living to some extent no matter how hard we try. As a matter of fact, I think it is essential if we are going to get back to some right track.

But the fact of the matter is that more dangerous to me as an individual is that we are losing control of our ability to think for ourselves. We are slowly but surely losing control as to who we can depend upon for our technological base and manufacturing base for our military capabilities.

There is a company in Japan, Nomura Securities, who probably played a preeminent role in stopping the crash of 1987, who on any given day can represent 25 percent of the purchase of all—U.S.

Treasury Bonds, or 5 percent of the total volume on the New York Stock Exchange.

This is big-time stuff. This is from a nation that started from zero in 1945, a nation that we had to clothe and feed and literally restructure.

Why is this happening?

The reason I think it is happening comes about from how we grew up. We are a nation today of 250 million people, or thereabouts, that grew up in a country over the last 200 years where virtually all resources that we needed to survive were internally available. Everything.

If you look at Japan, that was never the case. Japan learned something. Japan learned that every part of their society depended upon every other part, or they could not survive. They had no basic resources. We never had to worry about that.

So we literally could become isolationist, literally because we did not need anybody else at that point in time.

I want to make one other comment that I made earlier. We look at long term as 5 to 10 years. Some people go as far as 20. Japan looks at the long term as forever.

If you recognize that, the ballgame changes. The reason why cowboy movies are so popular in the United States is that we demand and assume that everything revolves around the philosophy of winners and losers. There has got to be a winner and there has to be a loser.

We are competing with people who recognize that competition is essential for success, but there should not be losers. Any time there is a loser in the society, the whole society loses. If Chrysler goes out of the automobile business, Ford and General Motors will ultimately be hurt, as well as the rest of the economy.

Japan understands that. When we look at the United States of America and we try to assess from the standpoint of the Government at large what we should be doing, we say to ourselves: We cannot have a national strategy. We cannot have an industrial policy because it means we are picking winners and losers.

That concept is an anathema to our competition. We assume there must be winners and losers. If that is the case, then it should be for the cowboy on the street to decide, not the Government of the United States.

My concern is that if the Government of the United States, particularly the President, does not recognize that we cannot have losers anymore—we have had enough losers to finish us all—if we cannot stop the concept that we have to have losers and therefore winners, we are going to lose everything. Basically the control of our destiny is in individual people to determine what we do and when we do it on any given day.

Technology follows markets. If we lose markets, we will lose all our technology. Markets support our educational system and give the insight as to what we should be working on, what we should be doing, what we should be learning, what is important, and on what basis, and at what point in time.

If we lose our markets, we will lose our educational system. If we lose our markets, we are going to lose our political system. I will give you a specific case in point.

With high definition products and systems, you are getting a huge advance in the ability to handle information. To the extent that that is the case, you may find as time goes on that media can be transmitted to the home in a far more desirable fashion through fiber optics because it handles much greater band width.

Recognizing that, you could well have a situation where terrestrial broadcast is no longer the way to fly. Now you have individual companies around the world picking up U.S. media companies. Those same companies have the ability to produce, and do now produce, the bulk of all the products that we use to produce, transmit, receive, and play back that same media.

Think about a situation where a foreign company—and by the way, there is nothing wrong with this; it is just the way things are going—has control over certain media enterprises and can transmit information in a way that is more attractive than anybody else to their own equipment.

Instantaneously you have somebody who can begin to influence the political aspects of the country. So how do you stop something like this happening?

Let me come back to one other thing. You asked about business. We in business still look at our lives as individuals. We all go home just like everybody else. We do look at each of our businesses in many respects, especially the smaller companies, as if we are each in boxing matches and there has got to be a winner, and there has got to be a loser.

We have been told through antitrust laws and every other way that you can talk and cooperate about things at a lower level. You can have a semitech. But when it comes for competitors to talk about end-use markets, you go to jail.

I am telling you that the concept of opportunity cost, the concept of avoiding the linkage between products and markets, and the assumption that there has to be winners and there has to be losers is death to our society as we know it.

So what do we do to avoid that?

The first thing you have got to do is that the President of the United States has to make it absolutely clear in every speech he makes, in every comment he makes around the Congress, to the United States as a whole, that it is no longer popular, it is no longer effective to assume that making a dollar on the basis of a deal at the disadvantage of the long-term infrastructure of our products and markets is acceptable.

This is not telling American business what to do, when to do it, and how to do it. When Perkin Elmer was going to be sold to Nikon, all of a sudden IBM said, gee, whiz, this is a big problem for us because they have certain technology there that is essential for making chips of a smaller and smaller dimensional characteristic. So a deal was made and SVG Corp., and IBM, and Perkin Elmer decided to keep the business here.

We have to recognize that this kind of situation is happening everywhere. We consider oil to be essential. It is essential because it is an interrelated strategic end-use market. It is so essential, and we have grown up with this knowledge all our lives because we love the automobile and we love all the things that oil will do for us, that we are willing to go to war if a bad guy threatens our

supply. But I assure you that there are other markets that are just as essential as the oil industry.

If you assume that oil is one of the legs of a human being, I assure you information systems are the mind. I would much rather keep my mind and figure out how to get the oil than the other way around. But we cannot conceive of that because our society does not let that thought exist.

The President has to be the guy that begins to move the Nation. In addition to that, he has got to do it with some degree of smarts. Therefore, there has to be somebody within the Nation, and hopefully within the Department of Commerce, or somebody like that, with the full backing of the President, that allows the Nation to begin to talk at the highest possible levels about end-use markets, allows competitors to talk to each other, allows whole segments of the economy to talk with other segments that never thought they had such an interrelationship before.

I sat in a meeting once where we were talking about the concern of Japanese dumping chips in the United States, and it was wiping out the semiconductor market. In the same set of circumstances in a different room another major industry leader who was producing the end-use product, was saying if we do something to halt the Japanese inflow of low-cost chips, you will make me no longer competitive in my product—that is, the end-use product that I am trying to sell where I need Japanese low-cost semiconductor devices.

The problem that that states is not whether he is or she is competitive or not competitive at the moment; what we are saying is that another Nation literally is able to take certain parts of our society and play one off against the other until nothing happens. Leadership has to come from the top.

We no longer can viably produce on the basis of opportunity costs. This leadership must come from the President of the United States.

The CHAIRMAN. This is such a wonderful discussion. You know, I just wish we had the whole country sort of in front of a television set watching it, and unfortunately we do not.

Just as a little side piece here for a minute, you know who we elect ends up being who decides whether we even discuss these issues, let alone how they are resolved. In terms of money into the political system, you talk about losing control, in technology, or markets, or a lot of different other ways. The foreign car dealers in the United States have a political action committee, and they put a lot of money into it and funnel it through to candidates that they see as being sympathetic to their point of view.

In the last election cycle in the United States, the foreign car dealers political action committee spent more money in campaigns in the United States to elect people favorable to their view than Ford, Chrysler, General Motors, and the United Auto Workers all put together, by a lot. It is just a little tiny piece of anecdotal data out on the side.

There is another one in terms of you know who hires all the \$200 and \$300 and \$400 an hour lawyers in this town that live very well and who interdict this political system all day long every day, and so forth, and try to tilt the policy balance on trade decisions and everything else. It turns out that foreign buyers of top-level legal

services in this city are the biggest consumers of legal services in essence today, and are having a terrific effect in terms of being able to take and tilt the process.

So we are seeing the economic, sort of the second or third level economic effects, coming back into our system, altering our own way in which we either take up or do not take up these questions, and how they start to get resolved.

How many business leaders in the country, if we took say the top 500 companies in the United States, how many CEO's and presidents of those companies would have the same sense of urgency or the same general definition of this problem say as the three of you? What would be your guess? What percent of the CEO's from the top 500 companies in America today?

Mr. PETERSEN. Using a base from just general conversational experiences, I would say 90 percent.

The CHAIRMAN. Ninety percent would have this——

Mr. PETERSEN. Yes.

The CHAIRMAN [continuing]. Very advanced sense of alarm and concern about the trend lines and a great sense of urgency about the fact that some key things have to be done differently.

Mr. PETERSEN. As far as the deterioration of our industrial base, deterioration of our technological base, and our educational base, I would go higher. I would go up to 97, 98 percent. When I drop the number down, it would be to what percent, for example, I would say absolutely we have to raise taxes right now. I think there is still a body of leaders in industry who would say let's keep on the supply side effort; it will win; it will be the prevailing and the right course.

So as far as the inherent problems of this country, I would say it is virtually everybody, 97, 98 percent.

The CHAIRMAN. So would you agree, the two of you? So what you are saying to us is there now is an overwhelming unanimity of view among the top business leaders in the country that we have got a very serious set of problems of the type that you have described.

Some new things need to be done to deal with them, and we need to change these trend lines. Is that a fair way to put it?

Mr. SCHACHT. Yes. I would agree with Don on both counts: One, that I think you get near unanimity about the definitional issue. I would get near-unanimity about long-term/short-term. I think you would get an honest difference of opinion about the tax revenues.

The CHAIRMAN. That is fine.

Mr. SCHACHT. Some of which is an odd set of statements. I do not want to be pejorative here, because I have identified my own bias, and that is that no matter how much you raise taxes, the deficit will remain the same.

The CHAIRMAN. Right.

Mr. SCHACHT. If you could deal with that issue, my own guess is you would swing the majority of the remaining members of the business community who are very concerned about taxes.

The CHAIRMAN. As a guy who lives on the other side of the circumference of that problem, the hard fact may there be that we have waited so long and the structural deficit is now so big, whether you use phony accounting or even worse if you used honest ac-

counting, you have got a Federal budget deficit that is up in the range of approximating \$400 billion this year—I mean, that is what we are pressing against—and the economy is sliding and adding to that.

You saw the story on the front of The Washington Post today about “Big Jump Up in Food Stamp Applications.” Well, that is something that is going to balloon the deficit, along with the reduced revenues from a softer economy.

Whether you are for taxes or against taxes, or for spending cuts, or whatever combination, we have let the problem get so big that now there is no one-shot answer.

Mr. PETERSEN. Right.

The CHAIRMAN. There is no strategy, once we resolve the debate among what should be the balance of strategy that is going to get this thing done in one jump, in which you cannot raise taxes enough probably without killing the economy.

Mr. PETERSEN. That is correct.

The CHAIRMAN. You cannot cut spending enough without cutting against all these other things and creating a certain kind of mayhem in that area, which sort of leads you to say: If that is right, should we not have done it back here sometime?

Mr. PETERSEN. It is easy to suggest.

The CHAIRMAN. You can see that the answer to that is, yes, but we cannot go back to that point. So the question is: How do we get out of this corner? And do we have time to get out of it, given the fact that our friends from around the world which are financing more and more, if they choose to, activity, have us in a very awkward spot.

So how do you develop a work-out strategy? How do you start extracting yourself from this corner that you have gotten wedged into? And is there a way to do that?

If we could get the debate even to that level of sophistication and reality, it would be a great thing.

Now the top 500 CEO's in this country, which is a pretty darned important group of people, have this sense of urgency about the need for the big strategy readjustment, though with some differences of opinion as to how much of this versus how much of that, which is fine—I mean, let us have that debate. Why is not that group in whole or in large part doing more about it?

I do not say that unpleasantly, because I can tell you why I think we are not doing more about it, and I am not happy about that, but why is that group that would be so keenly aware of the fact that we are losing the future, not forcing this issue with every bit of power and strength that it has?

Why is that not happening? Is there a natural reluctance for business to approach government? Do people lose their voice in the presence of the President? There is a lot of that. People walk in. I have had people that I know, other sectors of business go in and tell the President this or that. They walk in, and they are in the Oval Office, and their voice goes up three octaves and they talk about the weather and ball scores and they are out, and it does not amount to much.

But why is that not happening? And how do we make it happen? Is there a way to make it happen? Because we need that help, I will tell you right now.

I can invite you here, and within the limits of our time I will invite people like yourselves to come every single day, day-after-day-after-day, because I think this is what we ought to be talking about. But that does not necessarily move the focal point of government.

I do think we need to have the President, whoever happens to be President—it happens to be George Bush now—in this mind set. I mean, he has to be brought to the point where he believes and says and feels what you are saying today.

Now if 450 or 480 or 490 of the top CEO's in this country feel that way, is it not possible to somehow convey that orientation and attitude into the mind of the President of the United States? And if so, how do we do it?

Mr. PETERSEN. The one organization that brings not the 500 together but a significant group of the principal CEO's together is the Business Roundtable. It is an organization whose purpose is to lobby, which means to try to persuade, to come to this city and persuade both the administration and the Congress.

This is the only vehicle that I know of that we have right now that has the potential to do what you are describing.

Certainly the principal members of the executive committee, the policy committee, whatever—walk the halls of the administration and of Congress daily. There are any number of them in town on almost any day. So there is a voice being reflected through that channel.

Certainly as individuals, chief executives simply have to spend a large percentage of their time in this city because the activity in this city has such a major bearing on the activities of the individual companies.

If there should be something more formal in the way of gatherings of the Roundtable and the administration, or the Roundtable and Congress, either Senators or Representatives or a mixture, I do not know, but it seems to me something along that line could certainly be developed.

The CHAIRMAN. I think we need to do that. I know you must go because you have got to get back to Detroit, and the weather is not so great out there, and I am going to finish because you have been very patient with your time. Again, I am very apologetic of the fact I was tied up on the floor earlier, because this is the subject that I want to talk about and which I want America to have to talk about and think about.

I think an extraordinary level of new effort needs to be made to force this issue up through the morass of all the issues and right up into the top slot. Somehow the President has to really get sensitized while he still has some time to do these things.

I mean, he has a lot of other things to do, as we all do, but nevertheless this has somehow got to become the riveting centerpiece of how he thinks and how he orients his work and his people and so forth.

I also think just in political terms—I have been in both parties, so I am not here to make a partisan pitch in any way—it is a mar-

keting concept. I think the serious business leaders in this country should go to every candidate that is a perspective candidate for President in both parties early on, talk with them in a serious way, try to get these points of view across, try to get them sensitized, try to get them on track with their blend of the best strategy to accomplish these goals about which there is quite general agreement, and create some competition in the political marketplace where you get enough people who are pressing that issue that even those that do not want to find they have to.

So you create a situation where the level of competitive focus and dialog and creativity on that issue begins to build simply because you cause it to happen. You make it happen. That needs to happen. The business leaders of this country ought to be sitting down right now with the serious people that are willing to run for President, including the guy that is President, and really drive these points home in every possible way as forcefully as we can, and so forth. Because our future really is at stake, and it is slipping away from us.

I mean, you have said that today. The three of you have been as eloquent as I have heard anybody say it. It is just the way it is, unfortunately. I mean, I wish the story were different, and I know you do, too. If it were, you would not be here talking about this with the degree of concern that you are.

So with that, I am going to adjourn at this point and let you all get on to other things you need to do.

I want to thank you, very much. I will make sure that my colleagues, some of whom are out in the budget summit, some of whom are over on the Senate floor, some of whom are detained other places, will have the full benefit of the views that you have expressed today. I thank you all, very much for your leadership and your presence today.

Mr. PETERSEN. Thank you, Senator.

The CHAIRMAN. The committee stands in recess.

[Whereupon, at 12:35 p.m., the committee was adjourned, subject to the call of the Chair.]

[Response to written questions and additional material supplied for the record follow:]

RESPONSE TO WRITTEN QUESTIONS OF SENATOR RIEGLE FROM

Donald Petersen

Q.1. On page 6 of his prepared testimony, Mr. Schacht stated that he has "been concerned" for years, along with others, that a short-term perspective by our investment community is afflicting American industry." Do you agree with his assessment, and if so, what in the nature of our capital markets causes the investment community to have a short-term perspective? What changes in our capital markets would you recommend?

A.1 The Council on Competitiveness, of which I am a member, has, in conjunction with the Harvard Business School, undertaken a major project which examines this issue in great detail. The joint project is called Time Horizons of American Management. It initially tests the presumption of American short-term thinking by looking at investment behavior -- investment is one of the most quantifiable outcomes of management's decision-making process. U.S. investment performance is compared with two of our leading competitors, Japan and Germany, and is discussed in terms of both quantity and quality. At this juncture, there is some evidence that a confluence of conditions in the United States has contributed to a different investment perspective in the U.S. than in Japan and Germany. The project will seek to show what types of influences affect the U.S. management decision-making process and how these factors differ from those in Japan and Germany. Some of the project's preliminary findings will become known to the public as early as the first quarter of 1991. The Council will draw on the research to draft a report and make recommendations for private initiatives and public policy.

Q.2. Many analysts think it is important to distinguish between nationalities and industries when gauging the benefits of direct investment in the United States. These analysts believe that it is important to maintain U.S. control over certain industries which are particularly important sources of innovation and technological breakthrough in order to assure that new technologies, skills and methods will be diffused throughout our population. These analysts contend that foreign companies may not be willing to diffuse new technologies in the U.S. and that they may be reluctant to move high value-added jobs to the U.S. As a result, foreign direct investment may mean that the American work force could lose enhancement opportunities and may be relegated to low-paying, low value-added employment. What is your opinion of such an analysis? Do you think the U.S. Government should get more involved in reviewing foreign investments in the U.S. in order to evaluate their impact on the competitive position of American owned corporations in strategic industries?

A.2. In the past several years, the U.S. has relied heavily on foreign investment to fund its fiscal deficit and keep consumption levels high. Most of the foreign investment has flowed into stocks and bonds rather than factories or farms. In some cases, the acquisition of an American company has led to improved technology, more efficient management, and rising profitability. The more controversial acquisitions are usually part of a strategic approach to entering an American industry. There are three areas of concern: First, some foreign

investors are reluctant to buy from American suppliers. We have seen this problem in the auto industry where American auto parts suppliers have had great difficulty in selling to Japanese auto companies making cars in the United States. Second, there are acquisitions of major companies in the entertainment and communications industry, such as Sony's recent purchase of Columbia Pictures or the widely rumored takeover of MCA by Matsushita. The acquisitions make good sense for companies looking ahead to the integration of consumer electronics, computers, and advanced imaging technology. Their purchase by Japanese firms will make it more difficult for American firms to duplicate their strategy. Columbia and MCA are not just average firms -- they influence how we think about ourselves and the rest of the world. Third, foreign firms are buying everything from small stakes to whole companies in rapidly changing fields such as electronics or biotechnology. In many cases, the investment is small enough that it is not even noticed by American record keepers. Unlike European or Japanese firms, the United States has relied on many small start-up companies to develop new ideas and new technologies. European and Japanese firms usually grow new technologies inside the company. The foreign acquisition can disrupt this particularly American approach to growth and put leading technologies to work overseas first. In summary, I believe that it is important that Congress monitor the situation to determine whether circumstances merit government taking a more active role.

RESPONSE TO WRITTEN QUESTIONS OF SENATOR RIEGLE FROM

Richard J. Elkus, Jr.

PROMETRIX

October 18, 1990

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Senator Donald W. Riegle, Jr.
 United States Senate
 Chairman, Committee on Banking,
 Housing and Urban Affairs
 Washington, D.C. 20510-6075

Dear Senator Riegle:

I am responding to the questions as posed in your letter of September 21, 1990.

Q.1. On page 6 of his prepared testimony, Mr. Schacht stated that he has "been concerned for years, along with others, that a short-term perspective by our investment community is afflicting American industry." Do you agree with his assessment, and if so, what in the nature of our capital markets causes the investment community to have a short-term perspective? What changes in our capital markets would you recommend?

A.1. First of all, I agree totally that the perspective of our investment community is very short term; and as such, is making it very difficult for the United States to remain a competitive society in world markets. With respect to changes in capital markets that might improve the situation, I can recommend what I think has been obvious to many for a long time:

- A. Capital gains taxes should be reduced as far as possible, but there should be a timeframe required for holding this investment if one wants to take advantage of any tax breaks. My feeling is that this timeframe should be five years.
- B. I think it is reasonable to provide citizens as a whole with expanded capability similar to IRA programs for receiving tax breaks on savings. Here again, those tax breaks should be based upon long-term holdings; e.g., until the age of retirement.
- C. There should be an analysis made on the impact of current tax law which gives protection from taxation to mutual and pension funds as they trade in and out of stocks. The purpose here is to encourage long-term investment by all investors, be they individuals or major funds. (This should include government pension funds as well as private.)

The above comments notwithstanding, the fundamental problem facing our economy is a physical, not economic one. If you recognize that products and markets become interrelated and interdependent through

development, then the loss of products and markets in terms of U.S. participation means that the rest of the infrastructure of interrelated products and markets becomes threatened. Unless this point is clearly understood by the population generally--but most specifically by the President of the United States and his counsel of economic advisors--no implementation of tax law or change in capital markets will truly achieve the desired result because it will be in the nature of the population at large to find out how to make the most money in the shortest time under whatever circumstances exist at that time.

As I said in my testimony, it is like speed limits in California--if the goal of everyone is to maintain the infrastructure, we will try as a people to maintain that infrastructure. If our goal is to make the most money in whatever time is the shortest, we may attempt to do that under any circumstances at the expense of the infrastructure even though those efforts may result in the final economic and political demise of the U.S.

If people feel that a law should be obeyed, if they understand the purpose behind the rules and regulations and support that purpose, you have a chance. If they don't understand or don't really care, then maybe 80 miles an hour in the slow lane is still not fast enough.

Q.2. Many analysts think it is important to distinguish between nationalities and industries when gauging the benefits of foreign direct investment in the United States. These analysts believe that it is important to maintain U.S. control over certain industries which are particularly important sources of innovation and technological breakthrough in order to assure that new technologies, skills and methods will be diffused throughout our population. These analysts contend that they may be reluctant to move high value-added jobs to the U.S. As a result, foreign direct investment may mean that the American work force could lose enhancement opportunities and may be relegated to low-paying, low value-added employment. What is your opinion of such an analysis? Do you think the U.S. Government should get more involved in reviewing foreign investments in the U.S. in order to evaluate their impact on the competitive position of American-owned corporations in strategic industries?

A.2. Technology follows markets - not the other way around. In the long run--even in the short- run--if the United States of America is not able to compete in other markets because we do not let them compete in ours, we will lose the essential knowledge of what is happening around the world--knowledge that is required to maintain productivity within our own country.

We should not concentrate on what assets others are buying from us but what markets and the infrastructure to support those markets we are selling to others. We should be planning as a nation how we can reconstruct that infrastructure of end-use products and markets that we have lost or given up in the past. As such, we should be creating an environment for cooperation between companies within the United States to re-develop lost infrastructure of end-use

products and markets. Similarly, the government in conjunction with private enterprise in the U.S. should create an environment that enhances trade negotiations with other countries in support of joint ventures between U.S. and foreign companies to re-establish lost infrastructure of end-use products and markets in the U.S.

The problem we face cannot be legislated away. The problem we face is the result of the concept of opportunity cost. If you can make more money some place else, sell what you've got and buy the other. But if, in fact, products and markets become interrelated and interdependent, indiscriminate selling finally results in selling your birthright.

Until the President in his speeches and actions begins to demonstrate to the United States that opportunity cost without reasonable checks and balances is destroying the infrastructure of end-use products and markets in the United States and creates an environment to reverse this process, the only course of action will be that of condemnation of our international competitors, isolationism from world trade and an ultimate inability to compete on any basis.

Sincerely,

Richard J. Elkus, Jr.
Chairman

FROM

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NO. 3881910115 F. 0

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Room E40-253
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Cambridge, MA 02139
September 13, 1990

Mr. Chairman, Members of the Committee,

Thank you for the opportunity to submit testimony concerning the subject of U.S. competitiveness to the Senate Banking Committee.

My name is Charles H. Ferguson. I currently have three professional roles: I am a postdoctoral research associate at MIT; I am an independent consultant to high technology companies and investors; and I am a senior technology advisor to the investment banking firm of Tucker, Anthony in Boston.

For the past five years, I have concerned myself with the subject of international competition, particularly in technology-intensive industries such as semiconductors, computers, software, and telecommunications services. I have also, to some extent, been involved with studies of the automobile industry, the defense industry, and several financial services sectors. The subject of my Ph.D. thesis at M.I.T., for example, was Japanese-American competition in the semiconductor and computer industries. I am currently writing a book on American economic decline and its implications for corporate strategy, investment behavior, and for the future welfare of the United States as a nation.

In addition, I have served as a consultant to many multinational firms concerned with these issues -- including Digital Equipment Corporation, Intel, Siemens, and Xerox. I have consulted to a variety of U.S. government organizations and policy analysis efforts, including the Defense Manufacturing Board, the National Science Foundation, and the National Advisory Committee on Semiconductors. I also currently am involved in investment banking activities related to high technology industries, such as efforts to assess technology stocks and investment opportunities, and also to provide advisory services to firms interested in strategic alliances.

As a result of these various activities, I have a somewhat unusual opportunity to observe and participate in a wide array of private sector behavior, as well as an academic role in generalizing about the issues of international competition and the United States' position in this competition.

American Competitiveness

My conclusion, based upon these observations and my conversations with other experts in the same areas, is that the United States has

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already lost its position as the leading financial, industrial, and technological nation to Japan; that U.S. decline is continuing and perhaps accelerating; that the United States government continues to behave in a complacent and often counterproductive manner with respect to U.S. economic performance; that most of the problems associated with U.S. competitive decline are the result of dysfunctional U.S. government policies; that in addition, Japan continues to have unrestricted access to U.S. technology and markets, while also continuing to behave in a one-sided and often predatory manner towards other nations; and that the consequences of continued U.S. decline will, within five to ten years, prove devastating to the economic welfare and national security of the United States.

U.S. industries likely to suffer severe decline or, in some cases, to effectively disappear over the next decade include several that were until recently considered to be the strongest in America, and which are also in some cases absolutely critical to future industrial performance. For example, the U.S. semiconductor capital equipment, semiconductor, and computer industries are already in grave trouble, and are likely to suffer fatal damage over the next several years.

If this seems overly extreme, I would simply point out that foreign banks already hold about 20% of the U.S. commercial loan market; that the world market share of the U.S. semiconductor industry has declined from 60% to 35% in the last ten years, and continues to decline; that the U.S. is now a net importer not only of oil, cars, and steel but also of numerically controlled machine tools, semiconductors, computers, telecommunications equipment, consumer electronics, and office equipment; and that last year, the nation of Japan invested more in plant and equipment than the United States in absolute terms -- i.e., twice as much on a per capita basis. Coupled with U.S. deficits and the deteriorating position of the U.S. financial system, this decline in industrial performance is having an enormous effect upon the future condition of the country.

High Technology and the U.S. Financial System

The position of the U.S. financial system, and its weak position relative to that of Japan's, are issues of particular concern to U.S. high technology industries for several reasons.

First, high technology is capital intensive, even when it uses little physical capital equipment and even more so when it uses expensive factories. High technology industries require large expenditures for R&D long before commercial sales, with the result that the time horizons and competitiveness of firms are extremely sensitive to the cost of capital they face. The U.S., it is generally agreed, has severe disadvantages relative to Japan as a consequence of our low savings rates, our tax favoritism for consumption over investment, the short time horizons of institutional investors, and the structural fragmentation of the U.S. financial system relative to

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more concentrated foreign competitors.

Secondly, high technology industries are major inputs to financial services. IBM's largest customer, worldwide, is Citicorp; and financial services firms probably account for at least one-fifth of the U.S. business computer market. If the U.S. financial sector weakens, the result is less demand for U.S. information technology. Moreover, Japanese finance has much closer links to its domestic technology sector, by virtue of the structure of the Japanese economy. The result is that Japanese financial services institutions tend to buy Japanese information technology products, while also gleaning further knowledge of the sector itself by virtue of these major customer relationship.

And finally, Japanese financial services firms often serve an informal but critical role as consultants and advisors to Japanese industrial firms, a role difficult to replicate in the U.S. environment, where relationships are short-term and tend to involve unnecessary competitive duplication. For example, Japanese financial firms own equity positions in a variety of U.S. investment banks, advisory services firms, and venture capital funds, and thereby assist Japanese companies in obtaining access to U.S. technology, personnel, and distribution channels.

Altogether, then, it has become increasingly necessary for me to advise my investment banking and consulting clients to avoid commitments to areas in which Japanese firms are making major efforts, and/or in which I know that U.S. technology and financial resources are already outclassed by Japan. This detailed, firm-level strategy conclusion is reinforced by my academic and policy research, which make it increasingly clear that the United States is simply unprepared for the advent of the information age. If the United States continues on its present course, it would be no exaggeration to say that over the next twenty years, the U.S. will come to resemble an underdeveloped country such as Argentina more than it will resemble the most advanced economies in the world as exemplified by Japan, Germany, Singapore, and other nations.

Common Sense

I will conclude by submitting a draft position paper of an organization still in formation, founded by myself and a group of more senior analysts of U.S. and international industrial competition. The group, and the initial position paper, are called "Common Sense" -- because that is all they are. It does not take a brilliant mind to see what is happening to America. But it will take enormous willpower and resolve to reverse it.

Thank you.

COMMON SENSE - 1990

1. The undersigned are Americans whose careers have placed them in the mainstream of the U.S.-Japan relationship over the past twenty-five years, and who are seriously concerned over recent developments in that relationship. We believe:
 - That the United States has lost to Japan the industrial leadership of the world, and that the price of that loss, in terms of the current and future quality of American life and national self-esteem, is unacceptable to the majority of Americans;
 - That the principal cause of that loss has been the failure of the United States to keep pace with Japan in (1) industrial productivity and (2) effectiveness of government - most notably, but by no means exclusively, in the area of industrial policy;
 - That, although Japan is without question among our most valuable political allies, it is, at the same time, our strongest and most aggressive industrial competitor, and that U.S. failure to cope with this paradox has been, and continues to be, a major strategic weakness in American policy;
 - That Japan, as the new global industrial leader, is not only our most formidable competitor, but is, in fact, the only other power capable of challenging the U.S. for global industrial leadership. Japan, accordingly, must be the standard by which we measure our performance;
 - That the U.S. decline was preventable, and is now reversible, well within the established framework of American democracy. However, reversing it will require dramatic improvement in both the effectiveness of American policy and the quality of our political leadership;
 - That the incumbent leaders in both parties have demonstrated neither the vision nor the motivation to initiate the necessary changes. Those changes must be mandated by an enlightened, determined electorate or they will not occur;
 - That our political leaders and the media have not conveyed to the American public either the nature or the magnitude of our national decline, and, accordingly, that the most pressing current need is not for more policy prescriptions, but rather for a mechanism to take the problem forcefully to the people. The solutions, in our view, will be not only manifest, but attainable, when the problem itself has been clarified in the public mind.

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Biographic Summaries: Common SenseBruce R. Scott

Bruce R. Scott is the Paul W. Cherington Professor of Business Administration at the Harvard Business School. His major area of interest is the impact of public policy on the business environment. From 1963 to 1968, he lived in Europe and researched the French system of industrial planning. In 1972 he was appointed to head the required MBA course: "Business, Government, and the International Economy". His most recent work centers on the competitiveness of the U.S. economy. His books are: Industrial Planning in France (with John McArthur), U.S. Competitiveness in the World Economy (with George Lodge). He is currently at work on a sequel on U.S. industrial competitiveness.

Alan M. Webber

Alan M. Webber is Managing Editor of the Harvard Business Review. He was named a fellow of the U.S.-Japan Leadership Program in 1988, and recently returned from a three-month stay in Japan, where he met and discussed issues with the next generation of Japan's leaders. His columns and articles have appeared in a number of national publications, including The Los Angeles Times, The New York Times, The New York Times Sunday Magazine, and The Washington Post. At The Harvard Business Review, he has contributed a series of interviews with former heads of state, titled "The Statesman as CEO", and has written on such topics as leadership and global competition. He is also co-author of Changing Alliances, a recently published book on the competitive future of the American auto industry in the global economy. Previously, he was Special Assistant to then Secretary of Transportation Neil Goldschmidt.

William V. Rapp

William V. Rapp is Vice President, Mergers, Acquisitions and Finance, Mitsui Nevitt Capital Corporation. A specialist in corporate finance and cross-border transactions, Dr. Rapp served as Executive Director and General Manager of Corporate Finance in Japan for Bank of America from 1985 until June, 1989. Immediately prior to that, he had been appointed to a two-year tour as Minister Counselor for Commercial Affairs in the U.S. Embassy in Tokyo. Previously, he held senior positions with the Morgan Guaranty Bank in the U.S. and Japan, and with the Boston Consulting Group. Dr. Rapp has been the Toyota Visiting Professor of International Business at Columbia University, and has taught at Yale and NYU. His publications include: Competitive Development of the Japanese Automobile Industry, Strategy Formulation and International Competition, Japan's Industrial Policy, and numerous others.

Charles H. Ferguson

Charles Ferguson is an independent consultant, specializing in corporate strategy, computer technology and product strategy, and in electronics market analysis, serving clients in both the public and private sectors. In that capacity, he has advised the National Security Council, the Defense Manufacturing Board, the White House Science Council on semiconductors, U.S. Trade Representative, World Bank, and major corporations in the U.S. and Europe. He is currently a Postdoctoral Research Associate at the M.I.T. Center for Technology, Policy, and Industrial Development, and has been on the staff of the M.I.T. Commission on Industrial Productivity. He is currently writing a book on comparative corporate strategy, national industrial systems, and global competition in higher technology industries, emphasizing information technology sectors.

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Biographic Summaries: Common Sense (Cont.)Ezra F. Vogel

Ezra Vogel is Clarence Dillon Professor of International Affairs at Harvard University, and is a specialist on modern Japan and China. He was Director of Harvard's East Asian Research Center 1972-77, and Director of the Program on U.S.-Japan Relations at the University's Center for International Affairs from 1980-87. He was on the faculty of Yale University in 1960-61. His book, based on several years' work on China, Canton Under Communism, won the Harvard University Press faculty Book-of-the-Year award in 1970, and the Japanese edition of his 1979 book Japan as Number One is the all-time best seller in Japan of non-fiction by a Western author. In 1987 he was invited by Guangdong Province (population 60 million; capital, Canton) to do a study of that province since reforms began in 1978. The results are reported in One Step Ahead in China: Guangdong Under Reform. His current research focuses on the factors making for East Asian success and the challenge of East Asia for Western society.

William L. Givens

William Givens is President and founder of Twain Associates, a Boston-based consulting firm specializing in U.S.-Japan trade and investment matters. Previously, he was a consultant with The Boston Consulting Group, and served for five years as Special Assistant to Admiral H.G. Rickover, U.S. Atomic Energy Commission. From 1957-66 he was a language and area specialist (Japan) for the U.S. Department of State, serving for seven years in the U.S. Embassy in Tokyo. He is currently a Director of The Japan Fund, and formerly Director and Chairman, Policy and Planning Committee, Simplex Time Recorder Co. He was a member of the 1982 President's Private Sector Survey on Cost Control (Grace Commission), and led the team that evaluated the International Trade Administration, Department of Commerce. He is active as a speaker and writer on the public policy aspects of U.S.-Japan trade, and his articles on these subjects have appeared in Fortune, Business Week, The Washington Post, The Boston Globe, and other publications.